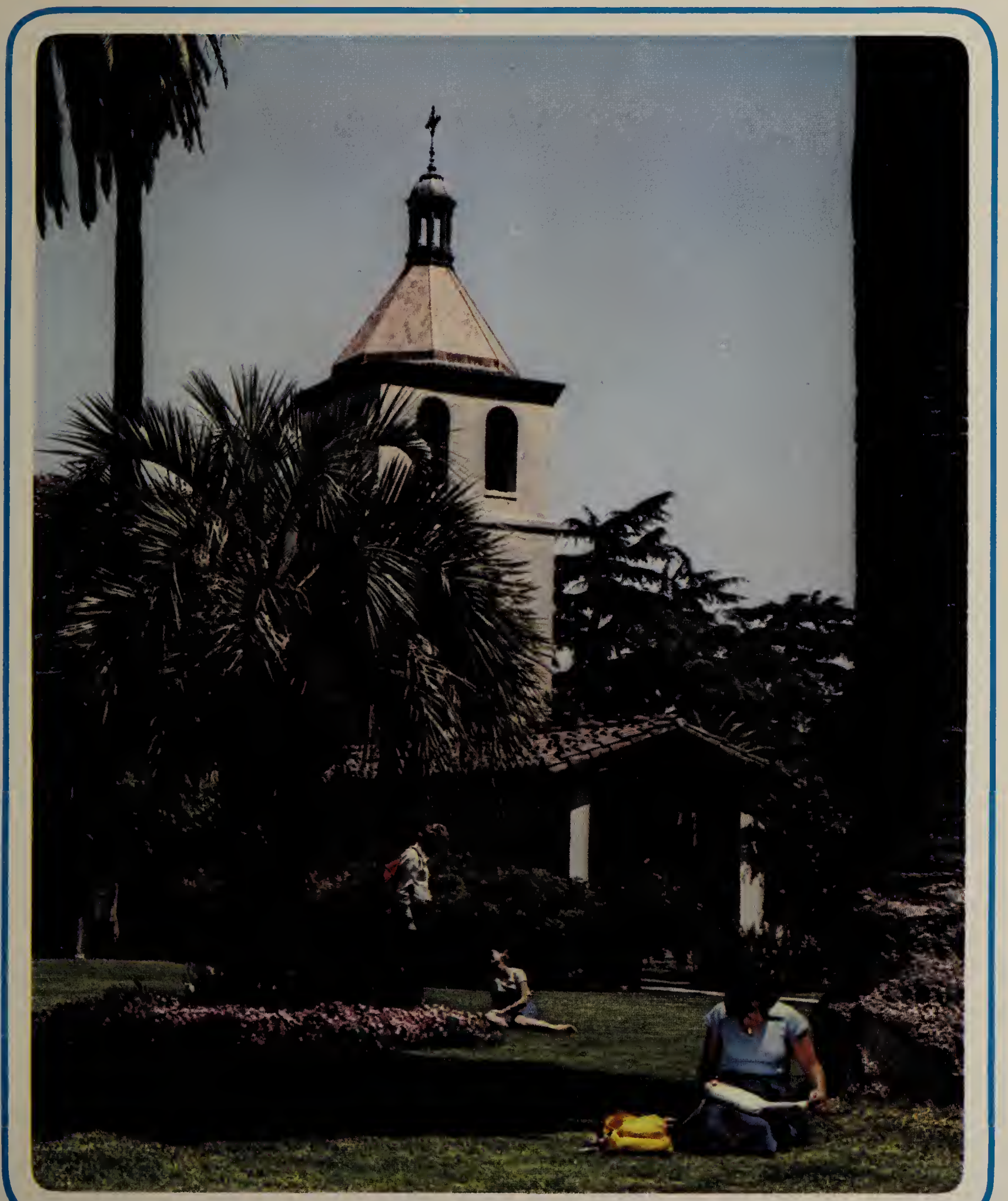
THE UNIVERSITY OF SANTA CLARA BULLETIN
UNDERGRADUATE COURSES AND DEGREES
1977-1978



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UNIVERSITY OF SANTA CLARA

University of Santa Clara Bulletin
Undergraduate
Courses & Degrees
1977-1978

PUBLISHED BY THE UNIVERSITY OF SANTA CLARA
SANTA CLARA, CALIFORNIA 95053

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General Information

UNIVERSITY ACCREDITATIONS AND MEMBERSHIPS

One Hundred and Twenty-seventh Year
1977-78

Accredited by the Western Association of Schools and Colleges
Accredited by Engineering Council for Professional Development
Accredited by the American Chemical Society
Accredited by the State Bar of California
Accredited by the American Association of Collegiate Schools of Business (Undergraduate and Graduate Programs)
Accredited by California State Board of Education
Approved by the American Bar Association
Approved by the American Medical Association
Member of American Council on Education
Member Council of Graduate Schools in the United States
Member of Association of American Law Schools
Member of Association of Jesuit Colleges and Universities
Member of Conference of Jesuit Law Schools
Member Conference of Western Law Schools
Member of College Entrance Examination Board
Member of Association of American Colleges
Member of Association of Independent California Colleges and Universities
Member of Council for Advancement and Support of Education
Institutional Member of the American Mathematical Society
Academic Member of the Mathematical Association of America
Member of the National Association of Schools of Music
Member of the Western Association of Graduate Schools

UNIVERSITY OF SANTA CLARA
UNDERGRADUATE CALENDAR 1977-78

FALL QUARTER

September 20	Tuesday	Freshman Registration, P.M.
September 21	Wednesday	General Registration (sophomores, juniors and seniors).
September 22	Thursday	Instruction begins for Undergraduates
September 28	Wednesday	Last day for late registration and the adding of courses
October 20	Thursday	Final date for removing Spring quarter 1977 undergraduate incompletes
November 1	Tuesday	Undergraduate deficiency grades announced
November 23	Wednesday	Last day to withdraw from undergraduate classes
November 24-25	Thursday-Friday	Thanksgiving Recess-Academic and Administrative holidays
November 30	Wednesday	Winter Registration for Junior and Senior undergraduates
December 5-9	Monday-Friday	Fall quarter undergraduate examinations
December 12-January 1	Monday-Monday	Christmas recess
December 13	Tuesday	Fall quarter grades due
December 23-26	Friday-Monday	Christmas Administrative Holidays
December 30-January 2	Friday-Monday	New Year Administrative Holidays

WINTER QUARTER

January 3	Tuesday	Winter Registration for Sophomore and Freshman undergraduates
January 4	Wednesday	Instruction begins for classes ordinarily scheduled for Tuesday
January 10	Tuesday	Last day for late registration and adding of courses (undergraduate)
January 15	Sunday	Commemoration of Martin Luther King's birthday
February 1	Wednesday	Final date for removing Fall Qtr. 1977 undergraduate incompletes
February 9	Thursday	Undergraduate deficiency grades announced
February 20	Monday	Washington's Birthday, Academic and Administrative holiday
March 7	Tuesday	Last day to withdraw from undergraduate courses
March 8	Wednesday	Spring Registration for Junior and Senior undergraduates
March 15-18	Wednesday-Saturday	Winter quarter undergraduate examinations

March 20-27	Monday-Monday	Spring Recess
March 21	Tuesday	Winter quarter grades due for undergraduates
March 24-27	Friday-Monday	Academic and Administrative Holidays inclusive

SPRING QUARTER

March 28	Tuesday	Spring registration for Sophomore and Freshman undergraduates
March 29	Wednesday	Instruction begins for Undergraduates for classes ordinarily scheduled for Tuesday
April 4	Tuesday	Last day for late registration and adding of undergraduate courses
April 21	Friday	Last day to file undergraduate pre-registration forms
April 26	Wednesday	Final date for removing Winter Qtr. 1978 undergraduate incompletes
May 1	Monday	Undergraduate deficiency grades announced
May 29	Monday	Last day to withdraw from undergraduate courses
June 3-7	Saturday-Wednesday	Spring quarter examinations for **all** undergraduates
June 10	Saturday	127th commencement
June 13	Tuesday	Undergraduate grades due 9 a.m.

SUMMER SESSION 1978

June 19	Monday	Summer Session begins

1977

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HISTORICAL PERSPECTIVE

On January 12, 1777, six months after the signing of the Declaration of Independence, a cross was planted at a site in the present city of Santa Clara by a Franciscan Padre, Tomas de la Pena, to mark the founding of the eighth of California's original twenty-one missions, Santa Clara de Assis.

Three quarters of a century elapsed before the University of Santa Clara, or Santa Clara College as it was first known, opened its doors as an institution of higher learning. In the intervening years, however, the Mission served as a spiritual center and school for the Indians. Besides religious instruction, the men were taught stock-raising, farming and the building trades; the girls, weaving and sewing; the boys, reading, music and religious drama. From 1777 until Mexican government secularization, February 27, 1837, some nine thousand persons were baptized at the Mission. More than eight thousand of these were young or adult Indians.

During the early period, the less solidly built Mission buildings of the first and second sites were destroyed by the flooding waters of the Rio Guadalupe. The third Mission church, of adobe, was completed in 1784 but was seriously damaged by earthquakes in 1812 and 1818. A fourth church, likewise of adobe, was used temporarily from 1819 to 1825. The larger fifth Mission with its quadrangle patio, also of adobe, was completed and dedicated August 12, 1825. The University's Adobe Lodge Faculty Club formed the west wing of the quadrangle.

The first site of Mission Santa Clara is marked by a California State historical landmark, located near the intersection of Kifer Road and De la Cruz Boulevard. Crosses mark the second site at De la Cruz Boulevard and Martin Street, and the third site at Campbell and Franklin Streets. the fourth Mission Church stood in the area between Kenna and Delia Walsh Administration building on the University campus to today.

During the first three decades of the nineteenth century, the old Mission enjoyed its most fruitful years. In 1827, well over fourteen hundred Indians lived within sound of the Mission's bells. In that year, some 15,500 sheep, 14,500 head of cattle and abundant crops of wheat, corn and beans were produced and cared for by the Indians under the Padres' guidance.

A combination of factors terminated the decades of prosperity at Santa Clara and the other California Missions. The Mexican War of Independence brought turmoil from 1810 to 1821 with resultant decrease of Franciscan personnel and donations in aid from benefactors. The new Mexican government took possession of the old Jesuit Pious Fund of the Californias that had been the main source of support for the Mission. Most of the Indian's lands, cattle and sheep became the object of spoliation by unscrupulous civil administrators.

In 1827 and again in 1829 governmental decrees ordered exile for all Spaniards who refused allegiance to the new regime. Since most of the Mission Padres were from Spain, many chose banishment. Some, however, remained until, in 1833, Mexican Franciscan replacements arrived from the missionary college of Zacatecas. Among them was Fray Francisco Garcia Diego y Moreno who was to become the first bishop of the Californias. Although thoroughly committed to the welfare of the Indians, the Padres' resistance to governmental encroachment upon the Indians' rights and property had little effect. Finally came full secularization of Mission properties, imposed at Mission Santa Clara in early 1837. This ended the effectiveness of the Franciscan missionary endeavor in Alta California. Within a few years, the Mission buildings and the Indian lands, cattle and sheep fell to the possession of the civil officials and their friends.

New People, New Ways

In the early 1840's a new people and a new way of life came to Alta California. Most of the immigrants were Anglo-Americans, attracted by the rich lands of the Santa Clara Valley. In 1848, the Treaty of Guadalupe Hidalgo ceded California to the United States. Statehood was granted in 1850.

It was in this setting that Santa Clara opened its classroom doors in May of 1851. The new Dominican bishop of San Francisco, Joseph Sadoc Alemany, had asked the Jesuit Father John Nobili, formerly of the Oregon Missions, to open a college at the Mission of Santa Clara. During the first academic year, 1851-52, Father Nobili and a faculty of three other Jesuit priests and four competent lay professors gave instruction to twenty-six students in arts, sciences, music and drama. By 1858, new scientific apparatus arrived from Paris and integrated courses in science as well as in the classics and in commerce were offered.

April 28, 1855, Santa Clara College received its charter from the State of California. Slow but steady growth followed and distinguished graduates became prominent members of California life. However it was not until the Schools of Law and Engineering were founded in 1912 and the courses in the Humanities and the Sciences were expanded that the College became the University Santa Clara.

Meeting the demands of urban growth in the Santa Clara Valley, the courses in commerce and finance were likewise amplified in 1926, and the University's School of Business Administration began.

In the same year, however, the old Mission Church was destroyed by fire. The present structure, an enlarged replica of the original, was completed in 1928 and consecrated by Archbishop John J. Mitty of San Francisco, October 9, 1936. It is roofed with the original mission tiles and contains many statues and paintings brought by the early Padres from Mexico. Likewise, most of the interior decorations of the church, especially the sanctuary ceiling, is a careful reproduction of that of the original Mission.

From the 1930's through World War II, the University's enrollment was relatively stable. With the return of many war veterans, came an enlarged student body, new resources and an expanded curriculum that led Santa Clara into a new era of rapid growth and development.

From the post-war period to the present, the face of the campus has been changing and expanding. Thanks to the generous support of many friends, twenty-three buildings have been added and still newer facilities—the Louis B. Mayer Theatre, Leavey Activities Center—and Cowell Student Health Center—have been completed in the early seventies.

In 1961 the University announced a major change in policy and accepted women students for the first time in its 110 year history and quickly became fully coeducational.

Although the student body has grown rapidly in the past decade, it has been held at a relatively small size—3500 undergraduates and 3500 graduate and law students.

Since 1960 the number of courses taught has more than doubled and there has been a proliferation of opportunities for individual study and research, including off-campus work/study programs.

In 1964 the University adopted an academic plan and calendar which divides the school year into three eleven-week terms and limits the number of courses a student may take to three or four in each quarter period.

As a independent, tuition and gift supported university, Santa Clara has been able to accomplish change in ways that reflect its traditional concern for the individual student.

Today, the University of Santa Clara, the first institution to offer classes in higher learning on the West Coast, continues its Mission heritage of service by assisting its students to equip themselves with the best of humanistic values and knowledge. Academic excellence in a well-balanced human being is the University's goal.

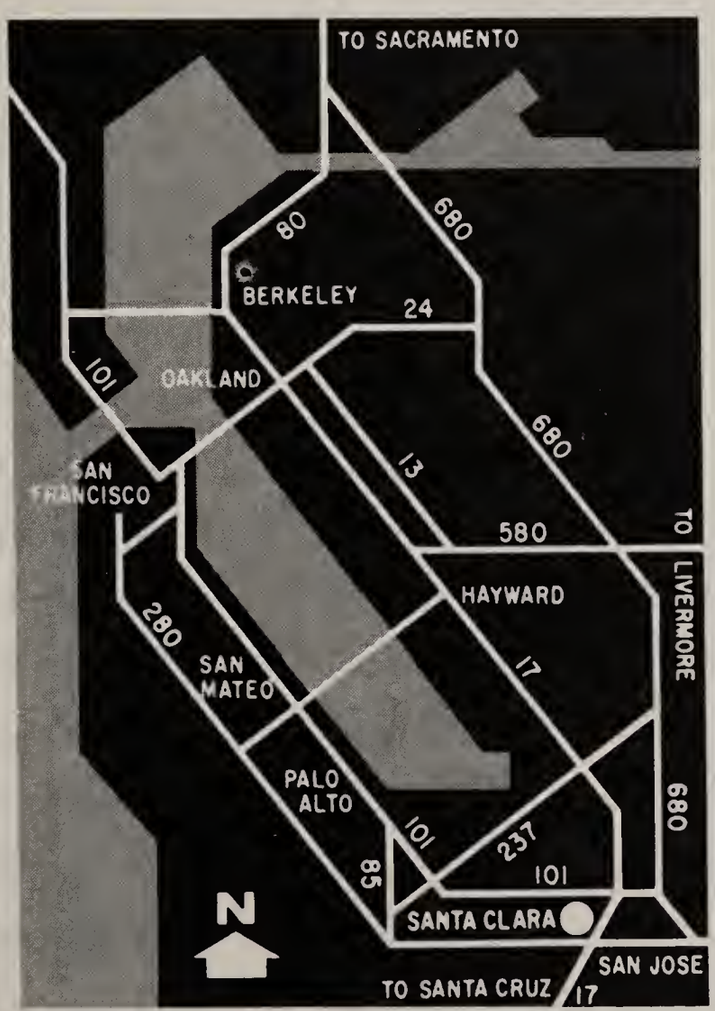
LOCATION

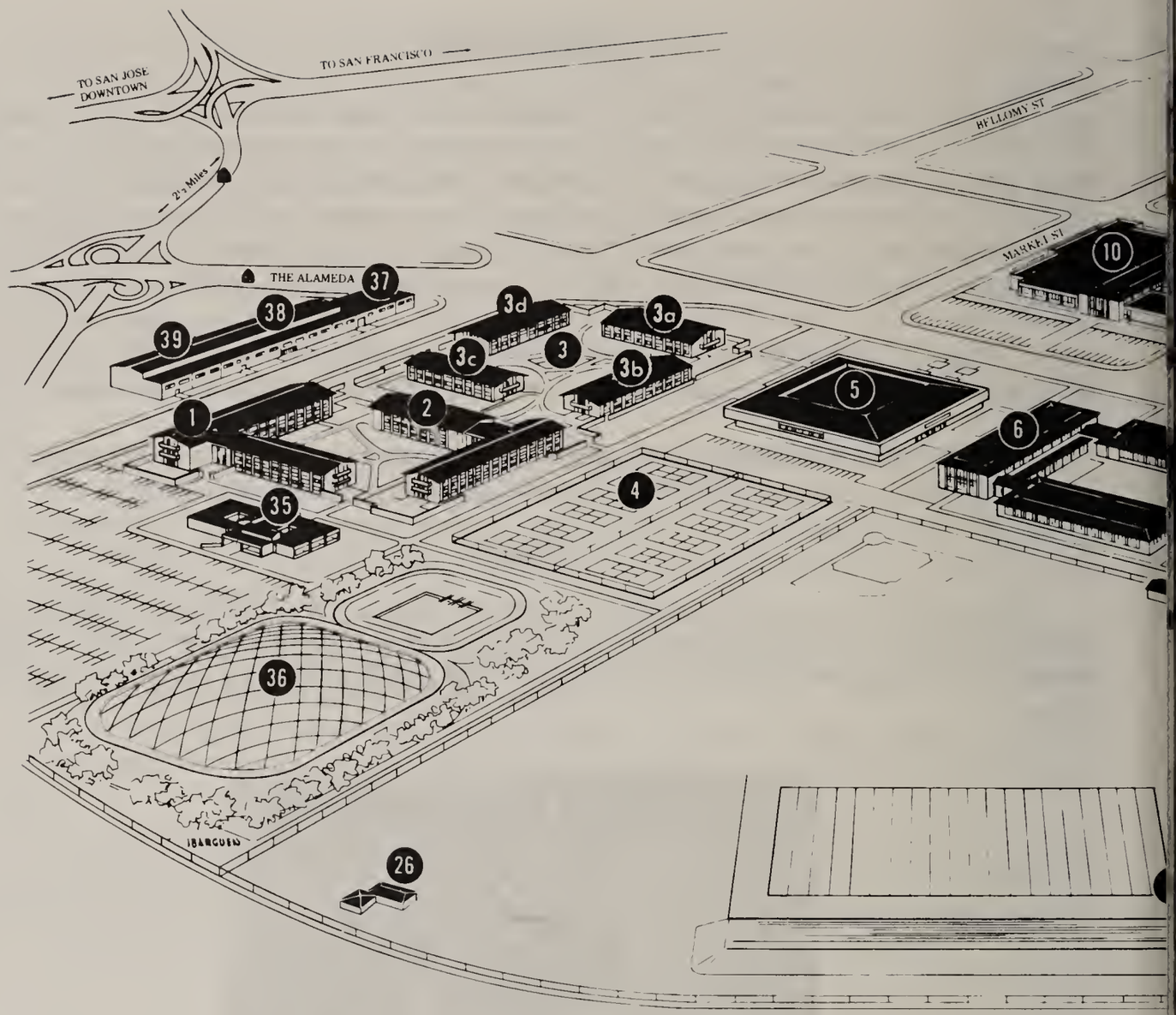
The University of Santa Clara is 46 miles from San Francisco near the southern tip of the Bay in an area that is rich in opportunities for learning. The campus is situated in the midst of one of the nation's great concentrations of high-technology industry and of professional and scientific activity. Many nearby firms and social agencies are world leaders in the search of solutions to man's most critical problems. The cultural and entertainment centers of San Francisco, Berkeley, Oakland and Marin County are within one hour's travel by bus, train or car. In the opposite direction, about thirty minutes away, are the beaches of Santa Cruz on the Pacific Ocean, and less than two-hours drive from the campus is world-famous Monterey Peninsula and Carmel.

The University is accessible by major airlines via San Jose Municipal Airport just three miles away and via San Francisco and Oakland International Airports.

Climate

Santa Clara has a moderate Mediterranean climate. Over a period of 67 years the average maximum temperature was 71.4° and the average minimum 41.6° . The sun shines an average of 293 days a year and the average annual rainfall is about 15 inches.





1. Sanfilippo Residence Hall
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3. Graham Residence Center
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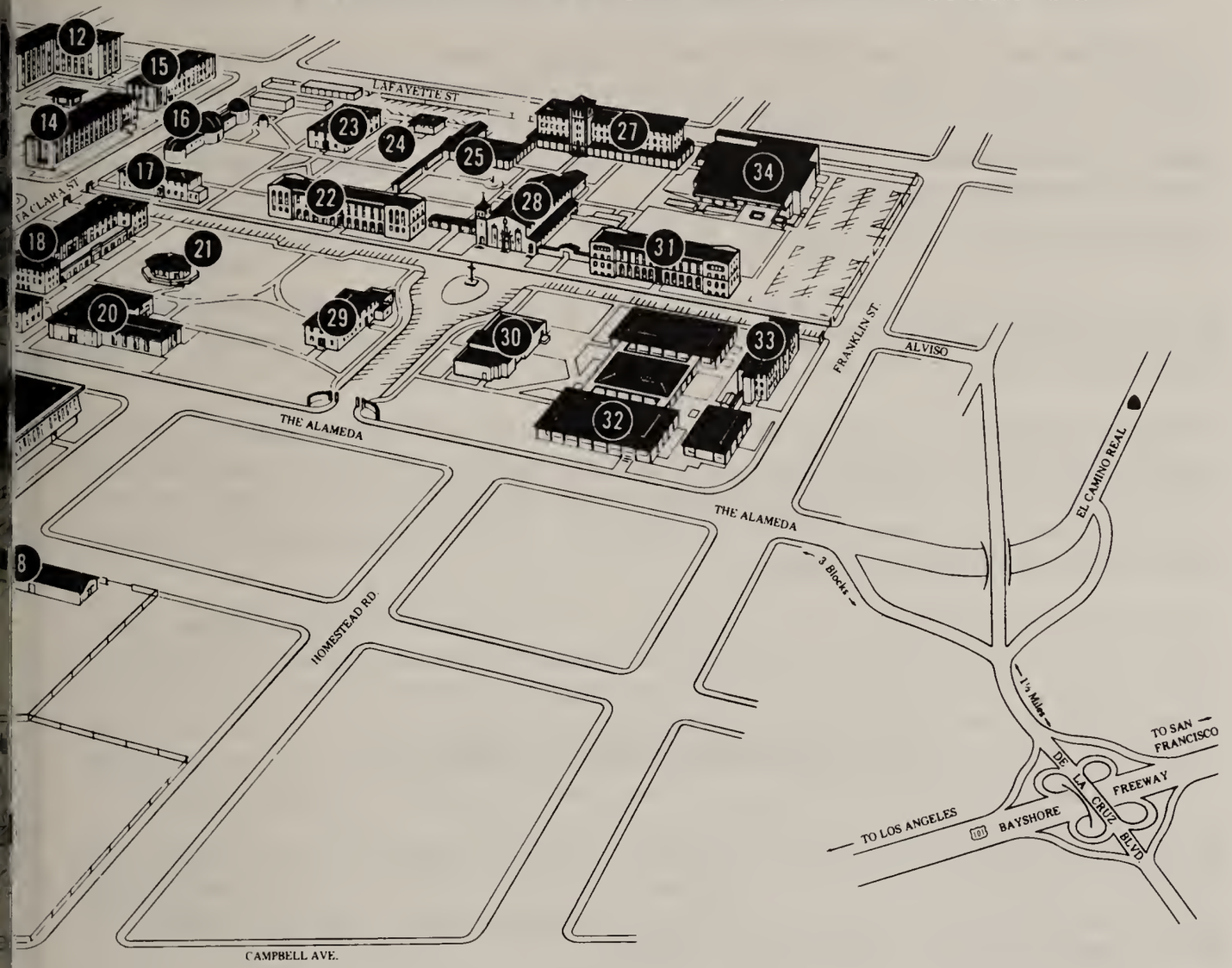
   - B Swig Hall
   - C Hancock Hall
   - D O'Neill Hall
4. Campus Tennis Courts
5. Michel Orradre Library
6. Sullivan Engineering Center
7. Bannan Classroom Building
8. Field House
9. Buck Shaw Stadium
10. Benson Memorial Center
11. Benjamin Swig Residence Hal
12. Dunne Residence Hall
13. John Kennedy Mall
14. McLaughlin Residence Hall
15. Walsh Residence Hall
16. Ricard Memorial Observatory
17. Donohoe Alumni House
18. Kenna Hall - School of Busine
19. Bergin Hall - School of Law

UNIVERSITY OF SANTA CLARA CAMPUS



20 Heafey Law Library
21 Admissions Center
22 St. Joseph's Hall
23 Varsi Hall
24 Restrooms
25 Adobe Lodge - Faculty Club
26 Univ. Day Care Center
27 Nobili Hall — Jesuit Residence
28 Mission Santa Clara
29 Walsh Administration Building
30 De Saisset Art Gallery & Museum
31 O'Connor Hall
32 Daly Science Center
33 Alumni Science Hall
34 Mayer Theatre
35 Cowell Student Health Center
36 Leavey Activities Center
37 Fine Arts Building
38 Ballet Building
39 Music Building

A STATEMENT OF PURPOSE

Inspired by the love of God through human service and the desire to serve through education, begun by the Franciscans who founded Mission Santa Clara in 1777 and continued by the Jesuits who opened the College in 1851, the University of Santa Clara declares its purpose to be the education of the human person in the context of its Catholic and Jesuit tradition.

The University is thus dedicated to:

the continuing development of a community of highly qualified scholars, teachers, students and administrators committed to an uncompromising standard of academic excellence;

providing an education that, in its emphasis on undergraduate education and in its pursuit of selected high quality graduate and professional programs consonant with such an education, stresses the development of moral as well as intellectual values, an education of the whole person, an education constantly seeking to answer not only "what is" but "what should be";

the continuing development of an academic community informed by Catholic principles, a community offering its members the opportunity for worship and for deepening their religious commitment, yet a community that is enriched by men and women of diverse religious and philosophical, as well as social and racial backgrounds, a community opposed to narrow indoctrination or proselytizing of any kind, a community wherein freedom of inquiry and freedom of expression enjoy the highest priority;

offering an integrated curriculum designed not only to provide the scientific and humanistic knowledge necessary to enable students to develop fully as persons, but also to demonstrate the unity of all forms of knowledge and to enable students to assume roles of leadership in the modern world;

encouragement of teaching excellence and of the scholarly research that promotes such excellence, of close student-teacher relationships, of experimental and innovative courses and teaching methods—courses and methods that not only stimulate the acquisition of knowledge, but the creative use of knowledge;

the continuing development of an academic community in which students, teachers and administrators dedicated to academic freedom and united in the search for truth, are actively involved in formulating and implementing the University's policies.

Board of Trustees
University of Santa Clara
January 22, 1975

DIVISIONS OF THE UNIVERSITY AND CURRICULA

Santa Clara offers varied undergraduate and graduate curricula. Within each school and college are the programs of:

College of Humanities

Classics, Education, English, Fine Arts, French, German, History, Italian, Music, Philosophy, Religious Studies, Spanish, Speech, Teacher Education, Theatre Arts, and General Humanities. Honors in most of the preceding areas.

College of Sciences

Biology, Chemistry, Economics, Mathematics, Physics, Political Science, Psychology, Sociology, Combined Sciences. Honors in several of these major fields.

School of Business

Accounting, Economics, Finance, Marketing, Management and Quantitative Methods, Agribusiness and Applied Economics.

School of Engineering

Civil, Electrical and Computer Science, Mechanical Engineering and Applied Mathematics.

School of Law

MICHEL ORRADRE LIBRARY

In August, 1964, the holdings of the Varsi Library were transferred to the new and spacious Michel Orradre Library, named in honor of one of the principal donors, the Orradre family.

The building now holds about 300,000 volumes and is designed to contain 600,00 volumes when further installations are made in the partially completed lower level.

The Library maintains an open shelf plan with special service areas grouped around the building's central core. The Library is an official depository for both California State and United States Governmental Documents.

The Library is open seven days a week for a total of 99 hours per week for the convenience and assistance of faculty, graduate and undergraduate students.

September, 1966, the holdings of the Michel Orradre Library in Biology, Chemistry and Physics were transferred to the new branch Science Library in the Edward Daly Science Center. Named after Mr. Frank Gentles, this collection serves the science departments in the immediate area for study and research.

CENTER FOR CONTINUING EDUCATION

The Center for Continuing Education embraces those areas of academic endeavor not a part of the various Schools and Colleges of the University. This includes the six-week Summer Session and Continuing Professional Education programs.

The Center is responsible for all University-sponsored seminars, workshops and conferences.

SUMMER SESSION

The University sponsors a six-week session each summer that offers both day and evening courses for college credit. Course work is available on both the undergraduate, and graduate level in both the normal six-week period and short-term workshops. No transcript is required for admission. Courses are shceduled in art, business (undergraduate), economics, education, English, history, language, mathematics, music, philosophy, political science, psychology, sociology, and religious studies. Graduate courses applicable to a master's degree are offered in education, English, history, languages, and mathematics.

Advanced placement for high school students permits high achievers who have finished the eleventh grade to enroll for university credit in freshman level courses and in intermediate languages. Recent graduates of high school are also eligible to enroll.

Board and room are available for men and women at reasonable rates in the University's attractive dormitories.

Evening courses in the Graduate School of Business, in the School of Law, as well as early-morning graduate courses in the School of Engineering, are separately administered. Information concerning these is obtainable from the individual schools.

CONTINUING PROFESSIONAL EDUCATION

The University makes its facilities for continuing education available to the general community and to business and industrial concerns. Evening classes are offered in the arts and humanities; certificate programs are presented in business, data processing, engineering, and finance.

In addition to the evening program, the Center sponsors numerous workshops and seminars in writing, engineering, and business topics. The Institute for Professional Growth is operated by the Center for the production of seminars and lecture series in a large variety of subjects for educators. The Institute for Continuing Engineering Studies produces workshops for practicing engineers. Travel Study programs are also available.

Certain Paraprofessional programs are now offered as certificate programs. At the present time a Paralegal Institute offers a 1-year certificate program for those interested in the law profession as a vocation.

Permanent records of the courses are kept in the Center's office and certificates are presented upon the completion of a set of courses in a given discipline.

Credit obtainable for these programs is for professional growth and not accepted at the University for degree credit.

AUDIO-VISUAL

The Audio-Visual department provides equipment and services to faculty and students for classroom use and to campus organizations for extra-curricular events. Available equipment includes projectors, record players, tape recorders, and public address systems. Some of the services are audio tape and photographic duplication, sound recording, and supplying personnel for operation of audio-visual presentations.

TELEVISION FACILITY

The University television facility is located on the second floor of St. Joseph's Hall. The facility serves the university in two ways: first, it is a "service" facility serving the faculty and students with videotape recording and playback equipment; secondly, the facility uses its studio and control-room for classes in color television production.

STUDY ABROAD

Because of many cultural and academic advantages, the University of Santa Clara provides opportunities for study in Europe and Asia. Through its affiliation with the Institute of European Studies, junior students may study at Durham, London, Nantes, Paris, Vienna, or Freiburg in Breisgau. In addition, the University is affiliated with the Rome program of Loyola University of Chicago and Gonzaga University's program in Florence. Santa Clara also has a Japanese studies program with Sophia University in Tokyo and a Chinese language program with Fu Jen University Language Institue in Hsinchu, Taiwan. Santa Clara credit is given for work done at these centers. The approval of the Director of Study Abroad is required for admission to any of these programs.

WHERE TO WRITE

There is a central mail room on the campus to which all mail addressed to the University of Santa Clara, Santa Clara, California 95053, is delivered. It will expedite delivery on the campus to specify the following as indicated.

Correspondence relating to the general interest of the University:
Very Reverend Father President

Communications regarding curriculum, scholastic problems, degree problems:
The Dean of the particular school or the Academic Vice President

Admission Blanks and Entrance Requirements:
Director of Admissions

Alumni Affairs:
Executive Director, University of Santa Clara Alumni Council

Athletic Program:
Director of Athletics

Diplomas and Graduation:
Registrar

Extension and Summer Sessions:
Director of Continuing Education

Foreign Students:
Director of Admissions

Gifts, Grants and Bequests:*
Vice President for Development

Graduate Study:
The Dean of the particular school or college

Honors Program:
Director, Honors Program

Jesuit Community:
Very Reverend Father Rector

Personal Welfare and Health of Students:
Dean of Students

Placement:
Placement Office

Publicity:
News Director

Readmissions:
Registrar

Residence Accommodations and Student Housing:
Housing Secretary

Scholarships:
Office of Financial Aids

Student Loans:
Office of Financial Aids

Teacher Certification and Placement:
Director of Teacher Education

Transcripts, Student Records:
Registrar

Tuition, Payment of Bills, Refunds:
Controller

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*THE UNIVERSITY'S LEGAL NAME is: *The President and Board of Trustees of Santa Clara College* to which should be added, *a Corporation, located at Santa Clara, California.* For the information of individual, corporation and foundation donors who wish the tax-benefits of their gifts and grants, the University is classified by the Internal Revenue Service as a 501(c)(3)(ii) tax-exempt organization and also as not a private foundation under Section 509(a) of the IRS code.

Student Life

Membership in groups and participation in extracurricular life are encouraged as such activity can be a valuable adjunct to the education of the Santa Clara man or woman. Although freshmen should limit their activities somewhat, they will readily find clubs whose purposes will correspond to their interests.

The Associated Students plan and administer an extensive social program which ranges from class—and group-sponsored picnics to more formal dances in prominent hotels in the San Francisco Bay Area. The University's proximity to San Francisco also allows it to bring the more famous personalities in the intellectual, cultural, and entertainment world to its campus.

Each student will find that the personal touch is very much a part of the Santa Clara tradition. Freshman Orientation is planned with the idea of familiarizing new students with the various phases of campus life. A large representation of upperclassmen will be on hand to meet with new students and to assist with the problems particular to incoming students. Special counseling and orientation plans for upper class transfer students take place prior to registration. The Fall Homecoming Weekend, scheduled for early autumn, is not only a highlight of the social calendar but also serves an an excellent way for students to become acquainted with each other and with the alumni.

The personal approach does not end with Orientation, nor is it restricted to student relationships. Faculty seminars in dormitory lounges and informal get-togethers provide relaxing medium for discussion and enjoyment.

The University feels that an active cultural and social program is an essential part of the educative process. Accordingly, the ASUSC and various organizations, under the supervision of the Dean of Students, execute an extensive and varied activities program. The new Mayer Theatre is expected to become the focal point for many of these activities.

The major intercollegiate sports are football, baseball, and basketball; other sports include tennis, water polo, soccer, swimming, crew, bowling and rugby. A full complement of intramural athletics is available for any student who wishes to participate.

The University maintains a program of instructional, intramural and intercollegiate activities for women. Tennis, swimming, volleyball, basketball, badminton, water-safety and many other sports are included, a number on a corecreational basis. Participation is open to all students according to interest and time limitations.

Although Santa Clara has grown rapidly in the last few years, it retains a friendly atmosphere and a personal relationship environment for which it is famous. This is a vital part of student life and an essential part of the University's particular kind of education.

STUDENT CONDUCT

The problem of conduct is a serious mandate on any University that accepts the responsibility for guiding students to maturity in an environment which respects human rights. Many students are away from home for the first time in their lives; others are finding new horizons opening to them as their educational experiences broaden.

The nature of the University demands that it operate in an academic atmosphere, in an intellectual and reasonable manner, and through orderly procedures—all in the pursuit of truth and wisdom. The preservation of rationality in the University is a necessity if it is to survive. Thus, any act or conduct which infringes on the rights of others, which restrains freedom of movement and expression, which is contrary to the maintenance of good order, and which is disruptive of the University's operation, either in whole or in part, is unacceptable and a violation of the University's rule of good order. Actions or conduct violating any local, state, or federal law are per se a violation of the University's rules and regulations.

Students who participate in any act or conduct contrary to the University's rules and regulations shall be disciplined according to the Manual for the Administration of Student Discipline. Serious violations may lead to disqualification or a lesser sanction. Copies of this manual are obtainable on request from the Office of the Dean of Students.

The rules and regulations of the University are not solely restrictive; they serve as a means to an end and are designed to aid in the development of each student.

STUDENT HOUSING

The University maintains 11 dormitories for men and women. They provide as homelike an atmosphere as possible within the framework of the University's educational requirements. While the vast majority of these residences are coeducational, with men and women occupying different floors or separate wings of the same building, a few dorms are reserved for students who prefer to reside in an all-male or all-female setting. Three swimming pools are available. Upperclassmen are encouraged to select their roommates, so personal preferences may be served as much as possible. Each student is expected to keep his room clean and free from health, safety and fire hazards. The University reserves the right to inspect rooms periodically and make necessary corrections or repairs.

While acceptance to the University as an undergraduate does not automatically includes acceptance in a residence hall, it is expected that undergraduate students who do not live with parents or other adult members of their families will live on campus. A Housing deposit must be submitted as soon as acceptance notification has been received. On the basis of the receipt of this deposit, the Housing Office will assign rooms on a space available basis. If the deposit is received after the deadline for receipt, it is likely that no room will be available. Students who move off campus before receiving official approval, will be subject to room and board charges up to the time such approval is given. Freshman will receive room assignments by mail no later than the month of August. Sophomores, juniors, and seniors may request a specific hall and/or roommate, if they wish.

During Spring Quarter of each year, returning students have the opportunity to select their room and roommate for the following academic year. A "Pre-Registration Form," distributed by the Registrar's office is used by the students to make their room reservation and must be accomplished by the room deposit. Students who cancel their reservation after June 30 will forfeit the room deposit.

Rooms are provided with beds, mattresses, towel racks, bookcases, chairs, desks, chests of drawers, and medicine chests. A charge will be made for damage to rooms of furniture. Students must provide blankets, sheets, towels, pillows, pillow-

cases, washclothes, bedspreads, and desk lamps. Helpful extras could include a typewriter, an alarm clock, ash trays, a mending kit, and closet accessories.

Special service rooms are conveniently located in each building, with proper outlets for electric irons, heaters, sun lamps, hair dryers, and such appliances which are not permitted in the rooms. There is à linen rental, laundry and dry-cleaning service available on campus for the convenience of the students. Television sets for student use are in various locations in the residence halls.

Residence halls will be closed during the Christmas recess. Students may remain on campus during this time, at additional expense and only if arrangements are made through the Housing Office. Arrangements for meals during the Christmas and Spring break must be made at the student's expense. The University reserves the right to use a student's room during the Christmas vacation period.

STUDENT GOVERNMENT

The system of student government at Santa Clara makes the students themselves responsible for the conduct of student affairs.

Students organize and supervise academic, cultural, and social activities through class government, clubs, and committees. Through the Board of Governors, the students establish the rules and regulations and sanctions governing student activity at athletic and social events, and at extracurricular events on campus. Dorm Councils are an adjunct of student government. They share with the residence hall staff the responsibility of regulating student life in the halls as well as promoting academic, religious and social programs to resident students.

Law students have their own Student Bar Association as the instrument of student government in the School of Law. Therefore, law students are not represented on the Board of Governors and are not subject to the jurisdiction of the Associated Students.

Student government at Santa Clara plays a vital role in the education of the students. As a genuine government of the students by the students, it develops responsibility and integrity in individual students.

Students also participate in unversity-wide governance through representation on the University Community Council, and on the University committees advisory to the president.

Associated Students

The Associated Students of the University of Santa Clara (ASUSC) is the student body organized for the conduct of student government. All fee-paying registered students are members.

The purposes of the ASUSC are to further the best interests of the University and its students, to encourage student activities, and to provide valuable experience and training in self-government and responsibility.

LEARNING RESOURCE CENTER

The Learning Resource Center is located on the second floor of the Benson Memorial Center, Room 212, and offers a variety of services to all members of the

University community. A professional staff of educators, psychologists and guidance specialists helps students enrich their educational and personal development.

The L.R.C. complements and supports other educational facilities through a campus-wide tutorial program. Students can obtain individualized help in many academic subjects. A program of study skills seminars offers the opportunity to improve those abilities which are essential to academic success. The L.R.C. also administers the GRE, GMAT, and Miller Analogies exams and maintains an extensive library of college catalogs.

Counselors are available to assist students in dealing with personal, emotional, social and vocational problems which may confront them. A variety of counseling and testing procedures are used according to the individual's personal needs. At all times the overall goal is to increase an individual's personal development by helping him realize his own resources and potential.

GRADUATE FELLOWSHIPS OFFICE

The Graduate Fellowships Office assists University of Santa Clara juniors and seniors who plan to enter graduate or professional studies upon graduation. It counsels these students in the selection of schools and in securing financial aid. This aid comes chiefly from private and public agencies offering fellowships and other grants through national and international competition. For competitions in which candidates must be officially nominated or endorsed by the University, the director of the Graduate Fellowships Office together with several members of the faculty selects the nominees and arranges the endorsements.

The Graduate Fellowships Office maintains a collection of current graduate and professional school directories, graduate division catalogues and other sources of special information pertaining to graduate study and financial assistance. The collection is available to all students, alumni and faculty members.

This office does not award fellowships, scholarships or other financial assistance for study at Santa Clara. These matters are managed by the Office of Financial Aid and by the graduate admissions offices of the respective Colleges and Schools in the University.

CAREER PLANNING AND PLACEMENT SERVICES

The Career Planning and Placement Center is located on the second floor of the Benson Memorial Center, Room 208. The Center offers a variety of services and facilities to all undergraduates, graduate students, and alumni of the University. The hours are 8 am-9 pm, Monday-Thursday; 8 am-4 pm Friday.

Employment opportunities, full — and part-time, on — and off-campus, are posted outside the office where they are accessible at any time. Additional information on these and other career opportunities is available inside the office.

Each year an on-campus recruiting schedule is arranged for graduating students seeking career employment. Numerous firms and government agencies participate actively in the program throughout the year. Graduating students are provided with copies of the interviewing schedule and are encouraged to take advantage of this opportunity.

There is a library with a wide range of literature about careers, descriptive brochures of the companies and agencies that recruit on campus, plus information on many other prospective employers.

Additional services offered are counseling on career planning, instruction on interview and resume techniques, and advice on other aspects of employment research. Assistance is available for teacher applicants and confidential files may also be set up.

MBA candidates for graduation may have their resumes included in a Resume Book that is distributed to employers throughout the United States.

Another program available to all students is "Innerview." This program is a joint effort of the Alumni Office and Career Planning and Placement and allows students with particular career interests the opportunity to obtain information directly from alumni who are actively involved in related careers.

STUDENT HEALTH SERVICE

The Student Health Service is located in the new Cowell Health Center on the campus and is under the supervision of the University Director of Medical Services.

All full-time undergraduate students and full—time law students are eligible for medical care under the following conditions:

1. The Student Health Service has a physician in attendance from 8 a.m. to 5 p.m., Monday through Friday while classes are in session. Visits to the Student Health Service during these hours should be made by calling the infirmary for an appointment. At all other times while the University is in session, medical care is available in cases of bona fide emergencies. With the exception of drugs, laboratory work and X-ray, no fee is charged to students utilizing the service.
2. X-rays, laboratory work, general hospital charges, consultations by physicians other than the University physicians and medical care rendered at a general hospital (with the exception of emergency room visits by one of the University physicians) will be charged to the student.
3. In-patient care is available to undergraduate resident students and day law students only, at no charge.
4. All students, of course, have the right to obtain medical care outside of the services offered by the Student Health Service, but in that case, the financial obligation for such care is the responsibility of that student.

All students are required to have a pre-entrance health examination by their personal physician. The results of such an examination are to be reported to the Student Health Service on the form designated by the University on or before the date of registration.

ATHLETICS

The University of Santa Clara maintains a well-balanced program of intercollegiate and intramural athletics for the benefit of the student body. All these activities are

designed to supplement the traditional academic curriculum. Intercollegiate competition is conducted in football, basketball, baseball, tennis, water polo, golf, soccer, crew, bowling, track and cross country, swimming volleyball and rugby against opponents of recognized national standing. The University is a member of the National Collegiate Athletic Association and the West Coast Athletic Conference.

A full program of intramural athletics in which all students are encouraged to participate is conducted under the direction of the Director of Intramural Sports.

Facilities for athletic activities include the new, two-acre Thomas E. Leavey Activities Center, which has gained national attention for its air-supported roof, with a 5,000-seat basketball pavilion and two smaller arenas, handball courts, weight training room, indoor track, 25-meter by 25-yard swimming pool and other facilities; centrally located tennis courts and athletic fields for football, baseball, softball, soccer, and rugby.

Women's recreation and athletics, serving some 1000 students, offers intercollegiate competition in basketball, volleyball, tennis, swimming, badminton, golf and crew and a varied instructional intramural program in swimming and water safety, first aid, tennis, golf, and flag football.

A co-rec (men-women) program in volleyball, softball, tennis, badminton, basketball and racquetball.

Athletic Officers

Patrick Carroll, S.J. ..... Moderator
George Giacomini, M.A. ..... Faculty Representative
George P. Malley, B.S. ..... Director of Athletics and Football
Carroll Williams, M.S. ..... Basketball
Salvador F. Taormina ..... Baseball
Marygrace Colby, M.A. ..... Director of Women's Recreation

Staff Members

Kenneth Allen, B.S.
Paul Bayhouse, B.S.
June Breda, M.S.
David Chaplik, B.A.
Robert Cicchi, M.A.
Richard W. Degnon, B.A.
John Dybvig, M.A.
Daniel Fitzgerald, M.S.
Richard Guarino, B.S.
Kathryn B. Ivers
Ronald Jeziorski, M.S.
Louis Lucas, B.A.
Mike Mazzel, M.S.
William Meyers, B.S.
Ronald Modeste, M.A.
Patricia Moore, M.S.
Michael Ording, B.S.
John Pasco, J.D.
Louis Pastorini, M.A.
Robert Phelps, B.S.
Edwin Pugh
S. M. Sanfilippo, J.D.
Henry Schmidt, B.S.
Salvatore Taormina
Edward Titus, M.A.
John Walsh

RELIGIOUS ACTIVITIES

The group of priests and laity who comprise the Chaplain's Office serve as facilitators for a variety of opportunities through which members of the University Commu-

nity are enabled to deepen their understanding and experience of themselves as humans and as Christians.

Central to the expression of Christian life on campus is the liturgy. Each weekend six Masses, celebrated with different styles of liturgy, are provided for the University Community. Four of these Masses are coordinated by groups of students and others working with the celebrant. Other Masses are provided during the weekdays and for specific groups as the need arises. In addition, marriages, baptisms, and communal celebrations of penance are provided for members of the University Community.

During the year, the Chaplain's Office sponsors a variety of weekend experiences for different segments of the University Community.

All members of the Chaplain's Office are engaged in varying degrees in providing counselling for members of the University Community.

The main religious organization on campus is the Christian Life Community, a 'community' of Christian men and women of Santa Clara who freely commit themselves to the service of God and mankind according to a specific spirituality based on the Spiritual Exercises of St. Ignatius of Loyola.

STUDENT ORGANIZATIONS

There are a number of national and departmental organizations on campus to which students may belong. These organizations generally fall into two categories: those that recognize achievement of individual students in their chosen academic fields and those special interest organizations which permit individual students an opportunity to meet with others having the same interests.

A complete listing of student organizations is given in the *Student Handbook,* available each year to all members of the student body.

GENERAL ACHIEVEMENT AWARDS

Nobili Medal: An annual prize of a gold medal founded by Joseph A. Donohoe, in honor of the first President of Santa Clara, the Rev. John Nobili, S.J., to be awarded to the male student who shall be judged outstanding in personal character, school activities and constructive contribution to the University.

Saint Clare Medal: An annual prize of a gold medal, established by the University of Santa Clara, to be awarded to the woman student judged outstanding in personal character, school activities and constructive contribution to the University.

COLLEGE PRIZES

Business Administration Prize: An engraved key given by the Business Administration Association to the senior in the School of Business who shall have made the greatest contribution to the School of Business.

The Isabel Jones Prize: An annual prize donated in memory of Mrs. Isabel Jones by her husband, Dr. Eliot Jones, to be given to the senior student of the School of Business who is judged by the Faculty of that School to be outstanding in scholarship.

The Charles J. Dirksen Prize: An annual prize donated by Dr. Eliot Jones in honor of Dean Charles J. Dirksen to be given to the junior student in the School of Business who is judged by the Faculty of that School to be outstanding in scholarship.

The Orella Prize: An annual award established in 1915 by the late Dr. Firmin R. Orella, B.S. '89, and funded in 1945 by his wife, Albertine S. Orella, to be given to the senior student in the departments of science who attains the highest average in scientific subjects during the junior and senior years.

The Schwartz Prize: Two annual prizes donated in 1955 by Dr. Sidney L. Schwartz of San Francisco, to be given to stduents submitting papers in Finance and Business or Economics which shall be judged outstanding by the Faculty of the School of Business.

Freshman Mathematics Prize: An annual award of books to a freshman student selected by the Mathematics Faculty for excellence in mathematical study and achievement during his freshman year.

The George W. Evans II Memorial Prizes: Two prizes awarded each year to the man and woman placing highest in the William Lowell Putnam Mathematical Competition. The prize fund was established by the family and friends of the late Dr. George W. Evans II of the Department of Mathematics.

DEPARTMENTAL PRIZES

Professor O. Robert Anderson Key: An engraved key in memory of Professor O. Robert Anderson to be given to the senior student in Accounting who is judged by the faculty of the Accounting Department of the School of Business to be outstanding in scholarship.

The Religious Studies Prize: A prize given by the President of the University, awarded annually to an upper-division student, for proficiency in religious studies selected on conditions set down by the department of Religious Studies.

Santa Barbara Medals: Four gold medals, given by the President of the University, to be awarded annually, on the recommendation of the Professor of Military Science, to the outstanding cadet in each of the four years of training.

The Sourisseau Prize: An annual prize founded in 1955 by Miss Eva Sourisseau of San Jose, in honor of her parents and family, to be given to the senior student of the University who shall be selected by the Department of Philosophy for outstanding philosophical achievement.

The Professor Joseph F. Deck Award: An annual prize to the outstanding chemistry major senior who has excelled in extracurricular activities, leadership, generous tutoring of fellow chemistry students, and undergraduate research, and who has maintained a B average withal.

The Michael Shallo Prize in Political Science: An annual prize founded in 1955 by the University, in honor of Father Michael Shallo, S.J., Professor of Political Philosophy, to be given to the student of the University selected by competition as the most proficient in political science.

The Finance Medal: Awarded to the senior majoring in finance with the highest scholastic average.

The Civic Club Italian Prizes: Three prizes contributed in 1949 and thereafer by the Civic Club of San Jose, to encourage the study of Italian language and culture, to

be given to the students attaining the three successively highest grades in the study of Italian.

The Medal of the Association of the Army of the United States: Awarded to the outstanding cadet of the first year of the Advanced Curriculum of ROTC, for exceptionally meritorious academic attainments, exemplary conduct, efficiency, and fidelity.

Department of the Army Superior Cadet Ribbon Award: Four ribbons awarded annually by the Department of the Army to the outstanding cadet in each academic class of Senior Division ROTC program at the University who has consistently demonstrated potential qualities as an office.

The Armed Forces Communications and Electronics Award: For academic achievement and meritorious contribution to the ROTC program by a senior cadet in a communications or electronics-related field.

The Ryland-Owl Prizes: The Hon. Caius T. Ryland founded in 1897 an annual purse leaving its disposition to the discretion of the Faculty. This the Faculty, after due consideration, assigned to the University Literary Congress, organized February 22, 1857, establishing the Ryland Debate to be held yearly between the two branches, the Senate and the House, and divided the purse into three prizes. The directors of the College Magazine, "The Owl," founded an annual prize to be given to the winner of an oratorical contest in the University. Since the oratorical contest is no longer held, the prize formerly awarded for the competition is now added to Ryland Debate prizes.

The William H. Leahy Prize: Founded in honor of Mr. William Leahy by his wife and by his brother, this prize is given to the graduating senior who has made the greatest contribution to dramatic art at Santa Clara.

The Handlery Prize: An annual prize founded by Mrs. Rose Handlery, in memory of her son, Raymond, of the class of 1934, to be given to the senior student of the University who will have contributed most to the success of any of the University student publications.

The McCann Prize: Annual prize founded in honor of Daniel M. McCann, B.S., '84, to be given for the best short story.

The Redwood Prize: Annual prize founded in 1908 by the executive committe of "The Redwood," and given for the best essay on an historical subject.

The Shipsey Poetry Prize: An annual prize founded in 1954 by Richard M. Schmidt, in honor of the late Reverend Edward Shipsey, S.J., to be presented to the student selected by the Faculty of the Department of English for the most outstanding contribution in the art of poetry.

The Gugliemo Armanino Prize: An annual prize founded by William J. Armanino in honor of his father is to be given to the outstanding student of the study of Italian Culture.

The Professor Lloyd Bolton Memorial Award: This award founded by the alumni of the Biology Department in memory of Dr. Lloyd Bolton, first Chairman of the Department, is given to honor the outstanding junior majoring in Biology.

The Regan Memorial Award: An annual award donated in memory of Patrick W. Regan, Class of 1947, to the outstanding junior in Civil Engineering, who is judged by the faculty of that school to be outstanding in scholarship, leadership and contribution to the Department of Civil Engineering.

The Justin McCarthy Oratory Prize: An annual prize established by Justin T. McCarthy to be given to a student in the senior class who has excelled in oratory.

Academic Information

CRITERIA FOR ADMISSION

The University makes selective and individual decisions on the applicants for admission. Freshmen applicants are offered admission based on the following criteria: first, secondary school record; second, scores on College Entrance Examination Board tests; third, school recommendation; fourth, personal factors such as extracurricular involvement, character, leadership; fifth, relationship to the University. The offer of admission to high school seniors for freshman standing is contingent upon the applicant's graduation from an accredited high school.

Nondiscrimination Policy

The University of Santa Clara admits students of any race, religion, sex, color, national and ethnic origin to all the rights, privileges, programs, and activities generally accorded or made available to students at the school. It does not discriminate on the basis of race, color, religion, sex, national and ethnic origin in administration of its educational policies, admissions policies, scholarship and loan programs, and athletic and other school-administered programs.

RECOMMENDED COURES

The following high school courses are recommended for a student applying for admission to the University as a freshman:

	NUMBER OF UNITS		
Course	*Humanities Majors*	*Business & Social Science Majors*	*Natural Science, Mathematics and Engineering Majors*
Algebra	1	2	2
English	3	3	3
History	1	1	1
One foreign language	2	2	2
Plane geometry	1	1	1
Lab science (upper division)	1	1	2*
Trigonometry			½
Optional+	7	6	4½

*Physics and Chemistry are required lab science for Natural Science and Engineering Majors

+Optional courses must be in advanced foreign languages, mathematics, laboratory science, or other solid college-preparatory courses.

ADMISSION PROCEDURE

The prospective freshman student should:

1. File the application and service fee of $20.00 with the Admissions Office, University of Santa Clara (application forms may be obtained from that office).
2. Submit a recommendation from the high school counselor, evaluating scholastic ability and character, to the Admissions Office (recommendation form is provided with application.
3. Request high school to forward a sixth semester transcript to the Admissions Office. A seventh semester supplement is included in the admissions packet to be forwarded to the Admissions Office when these grades are available.
4. Take the Scholastic Aptitude Test of the College Entrance Examination Board in January of the senior year or earlier, and request that scores be sent to the University. For information on dates and places of this test write to the College Board, ATP, Box 1025, Berkeley, California 94701, or Box 592, Princeton, New Jersey 08540.
5. Make certain all the above are completed, and the required materials are submitted to the Admissions Office by March 1. Full consideration cannot be assured for applications received after that date.

Sixth-Semester Decision

Students who have earned a 3.5 grade average (4.0 being straight A) in the first three years of high school work may seek an admissions decision after their sixth semester. Their application should be clearly identified. Transcripts reflecting six semesters of work and recommendation forms should be sent by the high school. The decision concerning admission will be rendered promptly. It is requested that early decision applicants submit College Board scores during the junior year or in the summer before the senior year. Students notified of acceptance after six semesters of high school work will not have to make the normal admission deposit until May 1 of their eighth semester, since it is assumed that a student applying under this special category will, if accepted, enter the University.

Advanced Placement

Advanced placement and College credit may be obtained through the College Board Advanced Placement Program. The student will be notified of the placement and credit the University will grant after scores are received.

Admission of Foreign Students

Candidates for admission who come from foreign countries must present a score in the Test of English as a Foreign Language, which is administered by the Educational Testing Service. Foreign students, both freshmen and advanced standing applicants, must also take the Scholastic Aptitude Test of the College Entrance Examination Board. In order to be issued Immigration Form I-20, applicant must be accepted as a full time student working toward a degree.

ADMISSION TO ADVANCED STANDING (TRANSFERS)

General University

The University accepts a number of transfer students, principally at the sophomore and junior levels, each year.

Since applications greatly exceed the number of such students who can be accommodated, and are increasing each year, no specific statement can be made about the quality of work (g.p.a.) which will enable a transfer applicant to be accepted. Only students in good standing at the last college attended will be considered. No student on academic or disciplinary probation, or suspension, will be considered for admission.

There is no minimum number of units required for transfer admission. An exception to this is the student who was not acceptable as a freshman. Such a student cannot be considered until he or she has completed at least 45 quarter units or 30 semester units of college work. In general, a student is classified by the number of units applicable to his degree program.

The Scholastic Aptitude Test of the College Entrance Examination Board is required of transfer applicants who have completed less than 45 quarter units or 30 semester units.

Transfer students may apply for admission for Fall, Winter and Spring quarters. Deadlines for applications to those terms are: Fall—July 1; Winter—Nov. 15; Spring—Feb. 15.

Transfer credit is fixed by the Deans of the College following the student's acceptance, and submission of registration deposit. No evaluation can be made before that time. The following general statements apply to transfer credit:

a. Courses from accredited four year institutions are generally acceptable if similar to courses listed in the *University of Santa Clara Bulletin.* Courses from accredited two year institutions are generally transferable under the same conditions, if (in California community colleges), they are designated as University of California transferable.
b. Courses of a technical or trade nature do not transfer.
c. Courses from non-accredited institutions, trade schools, extension or correspondence programs do not transfer.

School of Engineering

Admission to advanced standing is by specific action of the Committee on Academic Standing, which will evaluate all credits presented and determine the rating of the candidate.

The student normally will be admitted to advanced standing if he has completed during his first two years, a minimum of 60 semester, or 90 quarter units. Included in the units must be 12 semester or 18 quarter hours of Analytical Geometry and Calculus, 6 semester or 9 quarter hours of Chemistry or Biology, and 10 semester or 15 quarter hours of Physics for Engineering and Science students.

Financial Information

STUDENT EXPENSES
1977-78

Application Fee ..... **$ 20.00**
This charge is to be sent with each application form and is not refundable.

Deposits:

All new students or students reapplying for admission **$100.00**
This amount is automatically credited to the student's account at registration or at the time of full-tuition payment. This deposit is not refundable.

All returning undergraduate students must make the deposits indicated below by *May 1st.*

A deposit of $100.00 is required for all returning boarding students.
A deposit of $50.00 is required of all returning day students.
These deposits are not refundable after *June 30th.* Transfer from boarding to day student status after this date will result in forfeiture of $50.00 of the deposit.

Tuition and Fees per Quarter* **$970.00**

Part-Time Tuition (see definition of part-time student below.)
1 term course **$320.00**
2 term courses **$590.00**

Room and Board per Quarter** **$563.00**
Tuition, Room and Board are due and payable in full on the day of registration.

Fee for each change in scheduled course ..... **$ 2.00**

Fee for challenging a course (per course) ..... **$ 10.00**

Late Registration Fee ..... **$ 20.00**

Late submission of Form Fee (administrative forms, e.g. pre-registration, application for degrees, etc.—per day) ..... **$ 2.00**

Fee for Replacement of Identification Card ..... **$ 2.00**

Deferment Service Fee ..... **$ 10.00**

Breakage deposit for Chemistry Courses with laboratory, depending on course ..... **$5.00-$20.00**
(Unused amount returned to student at close of course.)

Additional copies of student's transcript of grades (each copy of transcript) ..... **$ 1.50**

Graduation Fee ..... **$ 30.00**

For Graduate Business, Engineering, Humanities, Law, and Summer Session, tuition and fees—see announcements of the various Graduate programs and Summer Session.

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*Tuition per quarter includes a refundable fee of $1.00 for student membership in Nor Cal PIRG.

**Room and Board charges during winter and spring recess: By arrangement with the Director of Housing.

Charges for loss or damage in residence halls, to other University property and special equipment will be billed directly to the student and parents upon report of damage or loss.

Special Information: A full-time student who drops courses during the term will be considered full time for the balance of that term for tuition purposes.

Part-Time Students:

For tuition purposes Part-Time Student is defined as a Lower Division Student taking less than three (3) term courses, or an Upper-Division Student taking less than two (2) term courses, regardless of the unit value of the course.

METHOD OF PAYMENT

Students should come prepared to pay all charges on the day of registration, or should have payments from home in the mail to reach the University at least TWO WEEKS prior to the date of registration.

Remittances should be made payable to the "University of Santa Clara" and mailed to the Business Office.

Students who have unpaid bills at the University or who defer payment without approval are subject to dismissal from the University and, as long as such payments remain unpaid, may not receive transcripts of credit nor any diploma.

For those who are not financially able to pay the full term charges in advance, there are several tuition plans administered by outside financing agencies which are available. Those who plan to avail themselves of one of these services should request information from the University at least three months prior to registration.

In addition, the University has several loan funds which are available to students and their parents.

REFUNDS

No refunds will be made by virtue of curtailment of services brought about as a result of strikes, acts of God, civil insurrection, riots or the threat thereof, or other causes beyond the control of the University.

REFUND OF TUITION: FULL-TIME STUDENTS

Students who withdraw from the University may receive refunds of tuition according to the following schedule:

For withdrawal prior to the first Monday after registration:
payment refunded *minus* **$210.00**
For withdrawal prior to the second Monday after registration:
payment refunded *minus* **$285.00**
For withdrawal prior to the fourth Monday after registration:
payment refunded *minus* **$405.00**

No further refunds of tuition will be allowed.

REFUND OF TUITION: PART-TIME STUDENTS

Students who withdraw from the University may receive refunds of tuition according to the following schedule, per course:

For withdrawal prior to the first Monday after registration:
payment refunded *minus* **$120.00**
For withdrawal prior to the second Monday after registration:
payment refunded *minus* **$135.00**
For withdrawal prior to the fourth Monday after registration:
payment refunded *minus* **$185.00**

No further refunds of tuition will be allowed.

REFUND OF ROOM AND BOARD

Refund of unused board will be prorated from the Monday following the date of withdrawal.

No refund will be made of the payment for a room in the University's residence halls.

Refunds cannot be processed until one month after the student's withdrawal.

The above fees and charges are subject to change without notice.

FINANCIAL AID

To assist deserving students in continuing their education, the University of Santa Clara maintains a broadly-based financial aids program of schòlarships, loans, grants and part-time employment. Administered by the Office of Financial Aids, these resources help bridge the gap between the cost of education and what parents and students can reasonably contribute.

The College Scholarship Service, of which the University of Santa Clara is a member, cooperates in this task by estimating the financial need of each student from information supplied on the Financial Aid Form. On the basis of this recommendation and subject to the availability of funds, the Office of Financial Aids is then able to prepare a "package" of aids for which the student qualifies. This could include a scholarship, loan, grant or part-time employment under the work-study program or any combination of the four.

The cost of a college education today is expensive, but not prohibitive. A family, therefore, is expected to make a maximum effort to assist the student with college expenses. Financial help from the University and from other sources should be viewed only as supplementary to the efforts of the family.

More complete information about the University of Santa Clara Financial Aids program is available in the *Financial Aids Bulletin,* published by the Office of Financial Aids.

Applying for Financial Aids

The different aids (scholarships, grants, loans, employment, etc.) vary in amounts and are renewable on a year to year basis provided the student fulfills the University's requirements and reapplies each year. The amount awarded in each type of assistance may vary from year to year depending upon the applicant's family financial circumstances. To apply for financial aid consideration, a student must:

1. Complete the Application for Financial Aid.
2. Submit a copy of the Financial Aid Form, designating that the University of Santa Clara receive a copy. (C.S.S. code 4851)
3. Complete an application for the California State Scholarship and/or the Basic Opportunity Grant, as appropriate.
4. Arrange to take the Scholastic Aptitude Test of the College Entrance Examination Board. California residents must take the test no later than the December test date to qualify for California State Scholarships.

5. Applications from students requesting scholarship or grant consideration must be submitted no later than January 15th.
6. The deadline for new students to apply for loans and work study is May 1st. Transfer students must supply a record of all financial aid received at previous institutions before they will be considered for aid.
7. Submit a notarized copy of parents latest federal income tax return. Freshmen students should supply a copy of their parents current year federal income tax return as soon as it is available but not later than May 1.

Freshman applicants who submit all required documentation and whose completed application is on file in the Office of Financial Aids by February 15th preceding September enrollment will be notified of the disposition of their application not later than April 30th; transfer applicants will be notified not later than August 1st. Applications that arrive late or incomplete will receive last priority of consideration and time may not permit notification to the applicant.

Present financial aid recipients must reapply each year and must submit all necessary documentation in time to arrive at the Office of Financial Aids not later than May 1st. Detailed information may be obtained by consulting the Financial Aids Brochure. Renewal forms are available at the Office of Financial Aids after March 1st.

The University supports a limited grant program for disadvantaged students. Students requesting consideration should contact the Office of Financial Aids or the Director of Black Affairs or the Director of Chicano Affairs.

Aid Qualifications

In selecting students to receive financial aid, evidence of financial need is required. Once this criterion has been met, priority of consideration for the limited funds is given to applicants with the highest scholastic attainments. Students of exceptional academic merit should write to the Director of the Honors Program.

Scholarship recipients are expected to maintain an overall grade point average of 3.00. All other aid recipients must maintain a GPA of 2.00. All financial aid recipients must remain enrolled as full-time students (minimum of 12 quarter units) for each quarter that aid is received and must make satisfactory progress towards a degree. Financial aid may be terminated at any time for serious infractions of the University's rules and regulations. As a general rule, graduate and professional students will receive consideration for financial aid after the undergraduate needs have been met. As a general rule, financial aid is not available for non-citizens unless they are in the United State on a permanent basis and have made application for citizenship. It is the Financial Aid recipients responsibility to notify the Financial Aids Office immediately of any changes in address, name, marital status, academic status or family financial situation.

Eligibility for financial aid is for a maximum of 12 quarters. Requests for an extension of this maximum must be addressed in writing to the Office of Financial Aids.

Loans

Because scholarships and grants are limited, many students applying for aid find the most advantageous method of financing their education through a loan program. Among those available to students are the National Direct Student Loan program and

Federally Insured Loans. Further information may be obtained from the Office of Financial Aids.

Deferred Payment Plans

Santa Clara provides a deferred payment plan which is administered through outside agencies. One-, two-, three-, and four-year contracts are available. Further information may be obtained from the Controller's Office.

Jobs

Employment during the school year is not encouraged, however, Santa Clara realizes that it is necessary in some cases for students to hold part-time jobs. The University maintains a Placement Bureau on campus to assist students in securing part-time work.

Students who receive financial aid are expected to contribute from their own resources at least $600 as self-help to assist in meeting their costs at Santa Clara.

Important Financial Aid Deadlines

December 1 ..... Deadline for applying for aid beginning in winter quarter.
First week..... Deadline for applying for California State Scholarships.
in December ..... S.A.T. exam taken no later than this test date for California State Scholarships (contact your counselor for exact dates).
First week
in December ..... Deadline for applying for the California College Opportunity Grant.
January 15..... Deadline for new Scholarship and Grant consideration.
February 1 ..... Deadline for applying for aid beginning in spring quarter.
April 15 ..... Deadline for applying for B.E.O.G.—however, you should apply as early as possible.
May 1..... Deadline for applying for financial aid *renewal.*
May 1..... Deadline for Freshmen applying for loans and work study.
May 1..... Deadline for Transfer students applying for loans and work study.

NOTE: All Guaranteed/Federally Insured Student Loan Applications must be in the Financial Aid Office completed not later than six weeks prior to a registration period. Applications received later than this will be processed as time allows, normally after registration.

Information on the availability of Summer School Aid will be available from the Financial Aid Office *after* April 15th.

STORAGE OF PERSONAL PROPERTY

The University of Santa Clara is not responsible for students' personal property located in dormitory rooms or storage areas on campus.

Loss from fire, dishonesty, destruction, or disappearance is strictly a personal matter. It is the individual's responsibility to secure his or her own insurance coverage.

STUDENT RECORDS

The following disclosures regarding a student's University records are given in compliance with the Family Educational Rights and Privacy Act of 1974 and are available for inspection as listed below:

a. Official academic records, including application forms, admissions transcripts, letters of acceptance and a student's Permanent Academic Record are on file and maintained in the Registrar's Office.
b. Working academic files are also maintained by each Dean of a School or College in their respective offices.
c. Records related to a student's non-academic activities are maintained in the Dean of Students Office.
d. Records relating to a student's financial status with the University are maintained in the Controller's Office.

The following types of records are *excluded* from inspection by provisions of the law; namely those created or maintained by a physician, psychiatrist or psychologist in connection with the provision of treating a student. A Parents' Confidential Statement of the College Scholarship Service is also excluded under this same provision. Third parties shall not have access to education records or other information pertaining to students without the written consent of the particular student about whom the information is sought.

A written statement on inspection policies, list of fees for copies and related information is available in each office containing student records. Complaints regarding academic records by students may be directed to the Dean of the College or School in which the student is enrolled.

Academic Regulations

COURSE REQUIREMENTS

The undergraduate program is scheduled on a basis of three eleven-week terms per academic year of nine months. The eleventh week will be devoted to examinations. During the freshman and sophomore years the student schedules twelve or sixteen units per term in lower division courses and during his junior and senior years, he normally schedules fifteen units per term in upper division courses.

Classes are normally scheduled on Monday, Tuesday, Thursday, and Friday. The Santa Clara plan of academic performance envisions considerable independent study by the students. Wednesday will normally be kept free of laboratories, examinations, and seminars, to provide uninterrupted study periods.

A freshman or sophomore may not carry less than twelve (12) quarter-units per term without the written approval of his Dean, nor may a junior or senior carry less than ten (10) quarter-units per term without the written approval of his Dean.

No student may carry more than seventeen (17) quarter-units per term unless he has a 3.3 grade-point average and has written authorization to do so from the Dean. The only exception to this regulation is for juniors or seniors who, with written authorization from the Dean, take more than seventeen (17) units for enrichment purposes. Such a course is graded on a special passed/not-passed basis (recorded as + or -) and does not fulfill graduation requirements.

Any student who registers for more than seventeen (17) quarter-units without prior written authorization from the Dean will not receive credit for the additional course(s). Registration in upper division courses is limited to upper division students, unless a Dean for special reasons will issue written authorization.

COURSE NUMBERING SYSTEM

Lower-division courses (numebered 1-99) are counted as four (4) quarter-units each, and upper-division courses (numbered 100-199) as five (5) quarter-units each, except those courses in the School of Engineering, Military Science, and Music as indicated in the course description of this bulletin and the Schedule of Classes.

PASS/NO PASS

A junior or senior who has declared a major may take on a passed/not-passed basis (recorded as P or NP) those courses certified by his departmental chairman to be outside his major. This option must be elected at registration and may not be changed after the close of late registration. Such courses, if passed, will fulfill graduation requirements. (P is equivalent to A, B, C+ or C; NP is equivalent to a D or F.) They are not used in calculating the student's grade-point average.

Lower division students (freshmen and sophomores) may not register for upper division courses without authorization of their Dean and provided that the student's program does not exceed seventeen (17) quarter-units. Lower division students taking such courses without prior permission will receive no credit for such a course.

Many of the above regulations are not applicable to the School of Engineering. See Graduation Requirements, School of Engineering.

STUDENT CLASSIFICATION

Students are classified by the number of quarter-units successfully completed (recorded as A, B, C+, C, D, or P).

Freshman	0-44 quarter-units	Junior	89-127
Sophomore	45-88	Senior	128-

(A student who completes his third year with only 127 quarter-units will require more than three (3) terms to satisfy the graduation requirement of 175 quarter-units.

A Part-Time Student is defined as a Lower Division Student taking less than twelve (12) quarter-units, or an Upper-Division Student taking less than eight (8) quarter-units. A limited number of undergraduate degree programs are open to part-time students. Admission to these programs is by special action of the school or college Committee on Academic Status. Part-time students are not eligible for financial aid.

GRADING SYSTEM

A student's grade of scholarship is given according to the following marks:

A	Excellent	F	Failure
B	Good	I	Incomplete
C+	Above Average	W	Withdrawal
C	Satisfactory	P (or +)	Passed
D	Inferior	NP (or -)	Not Passed

A student must earn a C average in all graded work undertaken and, in addition a C average in the courses of his major in order to qualify for the Bachelor's degree. To determine a numberical average, 4 grade points per quarter-unit are assigned for each A, 3 for a B, 2.5 for a C+, 2 for a C, 1 for a D, and 0 for an F. To arrive at the grade-point average, the total earned grade points are divided by the number of quarter-units which have been undertaken. A C average is 2.0.

REPETITION OF COURSES

A student may, with permission, repeat a course in which a grade of D or F was received on the first attempt. He should use the letter R in registering for the course again. All grades, whether repeated or not, will be used in computing the student's performance. Extra units earned in the repetition of a course graded D will not count in fulfilling graduation unit requirements.

WITHDRAWING FROM COURSES

Students may withdraw from courses without penalty up to one week before the beginning of final examinations. Dropping a course without a formal withdrawal will result in a grade of F.

ENTERING NEW COURSES

Students may enter a course for the first time only during the first week of classes of the term.

TRANSFER CREDIT AND CONCURRENT ENROLLMENT

Courses taken at other institutions after a student has enrolled at Santa Clara will not be considered for transfer credit unless approved in advance by the appropriate academic Dean at Santa Clara. This also applies to courses taken while on leave from Santa Clara. Permission for a concurrent enrollment will be granted only under very extraordinary circumstances.

Students who transfer a specific course to the University from another institution will not accumulate credit for these courses unless they are accumulated in sufficient quantity to total the quarter unit value of an equivalent Santa Clara course.

The student's grade-point average is computed only on work done at Santa Clara. Collegiate work at another institution with a grade of C or better may be transferred to Santa Clara and counted in fulfillment of graduation requirements, but it will not be counted in determining the student's grade-point average and rank in class. The transfer value of pass-fail courses at another institution will be determined individually in each case. A student attending Summer Session should not expect to receive more than ten quarter units credit for work taken during a regular Summer Session either on this campus or at some other institution.

INCOMPLETES

A student's work may be reported incomplete if, due to unavoidable illness, some essential portion of his work in the course remains unfinished after the final examination. An Incomplete (I) becomes a Failure (F) unless the unfinished work is completed to the satisfaction of the instructor and proper notice filed with the Registrar within four weeks from the beginning of the next scheduled term, not including the summer session. Make-up work must be in the hands of the concerned faculty member no later than the end of the third week so that the professor can meet the four-week submission dead line. Exceptions may be made by the Academic Vice President, in individual cases, on the recommendation of the appropriate academic dean. These exceptions must be approved by the Academic Vice President prior to the end of the four-week period just noted.

ACADEMIC PROBATION, DISQUALIFICATION REINSTATEMENT

Probation and Disqualification

Students whose academic performance does not meet specified norms, in terms either of units completed or of grades achieved, will be placed on probation or disqualified from further attendance at the University. These norms are:

	Probation			*Disqualification*		
	*Quarter Units Completed**		*Grade Points Below C*	*Quarter Units Completed**		*Grade Points Below C*
By end of 3rd term	Less than 36 q.u.	OR	Down 7-15 g.p.	Less than 28 q.u.	OR	Down 16 g.p.
By end of 6th term	Less than 76 q.u.	OR	Down 7-15 g.p.	Less than 64 q.u.	OR	Down 16 g.p.
By end of 9th term	Less than 113 q.u.	OR	Down 7-12 g.p.	Less than 100 q.u.	OR	Down 13 g.p.
By end of 12th term	Less than 160 q.u.	OR	Down 5-12 g.p.	Less than 150 q.u.	OR	Down 13 g.p.

*Not counting courses with grades of: F, NP, I, W, +, —
Part-time students are not subject to these norms.

Reinstatement

A disqualified student may request readmission to the University, but reinstatement is rarely granted and then only by special action of the Dean of the School or College in which he was formally enrolled and the Committee on Academic Status.

Requests for reinstatement should be addressed to the Admissions Office and should be accompanied by a full account of the student's activities during the period of disqualification which the student judges to warrant reinstatement.

WRITTEN EXAMINATIONS

Written examinations are held at the middle and end of each term. A report of the student's progress is prepared by the Registrar's office and mailed to his home only at the end of the term. A letter grade is posted by instructors at mid-term for each freshman, but grades for other students are posted only in case of deficiency (grade of D or F or NP).

DISHONESTY

A student guilty of dishonesty in an examination, papers, and other student work will be given a failure for the course. In special cases, the administration may impose the penalty of dismissal from the University.

WITHDRAWAL FROM THE UNIVERSITY

Students who wish to withdraw from the University must report to the Registrar for a withdrawal form and proper instructions. They will be advised that files of such students are only kept active for one year. Should they subsequently wish to return to the University, written notice must be given to the Registrar four weeks before the registration date set for the quarter in which they intend to resume their studies. Failure to give such notice will necessitate late registration to allow time for reviewing the records and preparing necessary materials. It is understood that returning students will register in the college they were attending at the time of their withdrawal.

Students who withdraw from the University after registering for any quarter will have their records marked accordingly, as well as notice of the time of such withdrawal.

If a student attends another university during the time of absence from Santa Clara, it is his responsibility to arrange for the transcript to be forwarded to the Registrar for proper evaluation and recording. (Confer section on transfer credit).

CHALLENGING COURSES

A course is said to be challenged when a student takes a special examination in the course for the purpose of obtaining credit for it. He may prepare for this procedure by directed independent study.

Any course in the catalog may be challenged except those specifically identified in the catalog as exempted from challenge (indicated by the letters NCX) and those requiring laboratories, studio, or specialized group work.

To challenge a course, a student must have a 2.2 cumulative average and a 2.5 average in his major field. Freshmen and transfer students are not eligible to challenge a course until they have completed one term of work at Santa Clara. A student desiring to challenge a course should obtain a form from the Office of the Registrar on which he will identify the course as well as any course he has previously audited or challenged. He must then receive approval from an instructor in the department and the Dean of his School. A fee of $10.00 will be charged for each course challenged. Only one course may be challenged per term.

The examination for challenging courses will be given on the third Wednesday of each term. The petition for challenging a course must be submitted at least two weeks before the examination date.

Grades will be issued for challenged courses in the same manner as those obtained through regular graded course work. Pass-fail challenges are not permitted. Courses successfully challenged will fulfill graduation requirements but will not count towards the total units required for graduation. Challenged courses may not be used in the performance of residence requirements. The department shall establish the level of performance to be obtained and any requirements in addition to an examination which will be three to four hours in duration.

AUDITING COURSES

Students may audit one course in addition to the three courses they take in the upper division, or the four courses taken in lower division work. A student may not enroll as a course auditor and then decide to take the final examination for credit. If he wishes credit for an audited course, he may challenge the course during the following term through the normal challenging procedure.

Students who are not full-time students pay $125.00 per course for auditing. A student may not audit more than three courses during his four years at Santa Clara.

ATTENDANCE

Students are required to attend all classes. Penalties for absences are left to the discretion of individual instructors.

CHANGING COURSES, MAJORS, SCHOOL OR COLLEGE

Certain administrative procedures for changing course registration, changing majors within a College or School, or changing from one School to another must be observed or the student will be incorrectly charged, to the possible detriment of his academic record. The necessary forms and procedures may be obtained from the Office of the Registrar. Students desiring to transfer from one College or School to another must, at the time of filing a petition for transfer, have an overall grade point average of 2.00.

A SECOND BACHELOR'S DEGREE

Ordinarily work toward a second bachelor's degree is discouraged by the University but complete changes of objective occasionally require attainment of such an additional degree. Applicants for admission to undergraduate study for a second bachelor's degree must indicate by their previous scholastic record a strong probability of academic success in this undertaking. Admission is subject to approval of the Dean of the School or College in which work is to be done. A minimum of forty-five quarter-units beyond the first bachelor's degree is required. Financial aid is normally not available to students seeking a second bachelor's degree.

RIGHTS RESERVED

The curriculum and regulations affecting students may be revised at any time at the discretion of the University administration.

GRADUATION—UNIVERSITY REQUIREMENTS

The general requirements for graduation from the University of Santa Clara can be summarized as follows:

1. Twenty-two courses (88 quarter units) in the first two years and eighteen (87 quarter units) (of which at least twelve are upper division) in the second two years, totaling at least 175 quarter-units, are the minimum course requirements for a bachelor's degree in all schools and college of the University. Courses in which an F or NP (or + or —) was received are not counted in these totals.
2. Achieve an overall academic performance level of a C which is a 2.0 numerical average.
3. Obtain a C average in the courses of the major.
4. A senior transfer student must complete the residence requirement of 45 units at Santa Clara in the Senior year. Other students who have completed 45 units as Juniors at Santa Clara may, however, fulfill this requirement by offering 35 units or more in the Senior year.
5. In addition to requirements established by the separate colleges and schools of the University, each candidate for a bachelor's degree must complete a certain number of courses in Religious Studies. Students entering the University with less than 44 quarter units are required to complete three courses in religious studies, at least one of which must be completed during one of the two final years. Students entering with more than 43 units but less than 88 must complete two courses, one of these during the final two years; those entering with more than 87 quarter units must complete one course before graduation.

FOR FURTHER GRADUATION REQUIREMENTS, PLEASE REFER TO THE DESCRIPTION FOR THE APPROPRIATE COLLEGE OR SCHOOL

GRADUATION HONORS

A candidate for an undergraduate degree who has a grade-point average of 3.45 graduates Cum Laude; one who has a grade point average of 3.70, Magna Cum Laude; one who has a grade point average of 3.90, Summa Cum Laude.

Honors will be based on all graded undergraduate courses attempted at the University of Santa Clara or elsewhere. Transfer students must complete at least two full years at the University to be eligible for honors, and honors will not be awarded superior to what would be merited by the student's record at the University of Santa Clara.

Academic Programs

THE SANTA CLARA PLAN

The purpose of the Santa Clara Plan is to minimize the diffusion of each student's interest and concentration by limiting the number of courses taken at any one time, and so to maximize the opportunities for independent study.

Dividing the academic year from September to June into three eleven-week terms and restricting the course load to either three or four courses per term allows the student to concentrate more effectively on a limited number of subjects at any one time. Yet throughout the four years there is ample opportunity for the student to explore a wide range of interests relating either directly or indirectly to his major field of study.

HONORS PROGRAM

The Honors Program is designed to meet the University's responsibility to its superior students by allowing them to pursue an Honors curriculum while majoring in any field. Lower division study for Honors students is a combination of seminars, limited to about 15 students, and lecture courses which presuppose work beyond the usual high school level. In junior and senior years Honors students work intensively in their areas of specialization. Much of their upper division work will be in seminars and directed research. Various Pass-Fail options encourage better use of electives outside their major fields. Special counseling opportunities and registration privileges are available for Honors students which enable them to create the curricula best suited to their abilities, preferences and future professional needs.

Students are considered for admission to the Honors Program on the basis of their high school records, class rankings, Scholastic Aptitude and Achievement Test scores, letters of recommendation, expressed interest and, when possible, interviews with the Director of the Program and faculty members. A 3.50 high school grade point average and a 1350 SAT total score (including a 650 verbal score) are the ordinary requirements for acceptance into the Program. The number of freshmen admitted to the Honors Program is limited to forty each year. To remain in the Program, students must satisfy their instructors that they are doing work of Honors caliber as well as maintain a 3.0 cumulative grade point average.

Toward the end of their freshman year, Honors students who have demonstrated exceptional academic responsibility are designated Honors Scholars, are released from all University requirements, and are permitted to follow a personalized program of studies during their next three years. Honors Scholars are chosen and counseled by a committee made up of their Dean, Department Chairman, and the Director of the Honors Program.

The awards "Honors at Entrance" and "Acceptance with Honors" which the University awards to high school students at high school commencement ceremonies does **not** constitute admission to the University Honors Program, nor is it related to the Honors Program in any other way.

PRE-MEDICAL PROGRAM

Admission to medical school is not dependent on any particular undergraduate concentration, nor is it guaranteed by graduation from Santa Clara. Programs which satisfy the requirements prescribed by the Council of Education of the American Medical Association are offered by most of the departments in the College of Science including Biology, Chemistry, and Physics as well as some of the departments in the College of Humanities. Although the curriculum may be arranged in such a way that the student may comply with the requirements for entrance to medical schools in three years, nevertheless, medical schools generally prefer that the student spend four years in preparation and include such cultural courses in his programs as will better fit him for the practice of medicine. The Pre-medical Advisor of the Biology Department, in conjunction with the student's own academic advisor, will assist him in preparing his program in the major of his choice. Prospective applicants for admission to medical schools are urged to study MEDICAL SCHOOL ADMISSION REQUIREMENTS OF U.S.A. AND CANADA which is published each year and is available from the Association of American Medical Colleges, One Dupont Circle, N.W. Washington, D.C. 20036.

PRE-DENTAL PROGRAM

Pre-dental programs meeting all the requirements for entrance into dental schools are offered by most of the departments in the College of Science including Biology, Chemistry, and Physics as well as some of the departments in the College of Humanities. The Pre-dental Advisor of the Biology Department, in conjunction with the student's own academic advisor, will assist him in preparing his own program in the major of his choice. ADMISSION REQUIREMENTS OF U.S. AND CANADIANS DENTAL SCHOOLS is published each year and is available from the American Association of Dental Schools, 1625 Massachusetts Ave. N.W. Washington, D.C. 20036.

PRE-LEGAL PROGRAM

There is no one best preparation for the study of law. Admissions officers in the best law schools look to breadth of background and quality of work. All concerned with the law and its teaching, however, agree that the ability to write and to speak with clarity and precision is of paramount importance. A course in accounting is virtually essential. This can be said about other preparation: a broad foundation in the social sciences, coupled with a careful selection of courses in English, history, and speech, is most desirable. The precise selection of courses will vary with the major and with the different needs and aptitudes of the student.

PRE-TEACHING PROGRAM

Preparation for prospective teachers is offered by the Department of Education. The Department assists candidates to plan their undergraduate programs so as to include courses that will meet the requirements for the California State teaching credentials.

COLLEGE OF HUMANITIES

John H. Gray, S.J., Ph.D., *Dean*

The College of Humanities confers the degree of Bachelor of Arts in English, Fine Art, French, General Humanities, German, History, Italian, Music, Philosophy, Religious Studies, Spanish, and Theatre Arts.

The College of Humanities also offers programs leading to the California State teaching credentials and, through its Graduate School, confers the degree of Master of Arts in Education, English, and History. A full description of all graduate programs is offered in the *Bulletin of the Graduate School of Humanities.*

GRADUATION REQUIREMENTS

The College of Humanities requires that for a Bachelor of Arts degree the candidate complete 175 quarter units; of these at least 60 must be earned in upper division courses taken during the junior and senior years.

In addition to the requirements of his major department, the student must meet the following general education requirements:

8 units in English composition (EN 1 and 2 or substitutes);

8 units in science (biology, chemistry, physics, or engineering science), 4 units of which may be taken in mathematics (including statistics or quantitative methods);

12 units in a single foreign language (or completion of course 3 or 21);

4 units in a social science;

4 units in philosophy (normally PL 4; alternatively PL 1 or 2);

4 units in a creative or performing art (a history or theory course, except Music 20, will not satisfy this requirement);

12 units in the Humanities, outside the major field of study, by taking one of the following series of *core* courses:
African Civilization (History 55, 56, 57),
Asian Civilization (History 51, 52, 53),
History of Western Art (Fine Arts 71, 72, 73),
History of Philosophy (Philosophy 1, 2, 21),
Latin American Civilization (History 61, 62, 63),
Western Civilization (History 4, 5, 6),
Western World Literature (English 61, 62, 63).

12 units in Religious Studies (the University requirement), see page 47.

Humanities Courses. The College of Humanities offers experimental, interdisciplinary courses each quarter. These courses, offered by the College rather than by a department, combine several academic disciplines (e.g., literature, history, philosophy, and theology), and are suitable as electives. Occasionally the College also offers "institutes" or series of courses on a single theme (e.g., Sexism in American Society). Admission to "institutes" is by permission of the director.

COLLEGE OF HUMANITIES
DEPARTMENT OF EDUCATION

Kenneth E. Blaker, Ph.D., *Chairman*

Professor: Gerald E. McDonald
Associate Professors: Louis I. Bannan, S.J., Kenneth E. Blaker, William W. Yabroff
Assistant Professors: John T. Colligan, Jerome Kroth, Charles D. Swenson, Jo Ann Vasquez, Mary Anne Wakefield, Lawrence Wolfe
Acting Assistant Professor: Joyce A. Gerard

Pre-Teaching Advisement

Undergraduate students who wish to enter the teaching profession are urged to attend the orientation lectures and the seminars provided by the Department of Education. Several academic departments in the Colleges of Humanities and Sciences have designed curricula for prospective teachers. Students who aspire to teaching are encouraged to seek advisement from their major departments and from the Department of Education during their undergraduate studies in order to prepare themselves for studies leading to a teaching credential.

The California Teacher Preparation and Licensing Law of 1970, commonly referred to as the Ryan Act, is in the process of being implemented. Undergraduate students seeking teaching credentials will be affected in various ways; consequently they are strongly advised to consult with the Director of Teacher Education regarding their undergraduate studies.

Teaching Credential Program

The University of Santa Clara is accredited by the California State Board of Education to recommend qualified candidates for a credential to teach in public schools. Persons seeking this credential must first be admitted to the *Teacher Credential Program*. An appropriate undergraduate degree, plus a postgraduate year of studies is required to be fully credentialed, but a *preliminary* teaching credential is obtainable upon completing the *Teacher Credential Program* during the Senior year.

In order to obtain the *preliminary* teaching credential, students must begin planning their program of studies during their Freshman year, although formal application for this program should be made during the Junior year.

A *Life* (permanent) credential is earned upon completion of a year's study beyond the baccalaureate degree. This must be completed within five years of first employment of the certified employee.

The minimum requirements for the Single-Subject and Multi-Subject Credentials are as follows:

1) A baccalaureate degree or higher degree, except in professional education, from an approved institution.
2) An approved program of professional preparation.

3) Passage of a subject-matter examination, *or* holding a baccalaureate degree when the subject matter of the degree is the same as one of the subject matter examination categories.

4) Demonstration of a knowledge of the various methodologies of teaching reading by successful completion of an approved program of study (not to exceed ten quarter units) or passage of an approved reading examination.

I. Single-Subject Credential Program

Under the Ryan Act, there is no longer a Secondary Credential; in its place is the "Single-Subject Credential" which will allow its holder to teach only in a specific subject area. The law has specified 14 such areas: 1) English, 2) Physical Science, 3) Mathematics, 4) Social Science, 5) Industrial Arts, 6) Physical Education, 7) Business, 8) Music, 9) Art, 10) Home Economics, 11) Foreign Languages, 12) Life (natural) Science, 13) History, 14) Government.

II. Multi-Subject Credential Program

Under the Ryan Act, there is no longer an Elementary Credential; in its place is the "Multi-Subject Credential" which qualifies the holder to teach any subjects in a self-contained classroom from the Kindergarten through 12th Grade. To fulfill academic requirements for this credential, undergraduates can be declared humanities majors. A pre-designed program includes a minimum of 126 quarter units, with a minimum of 32 quarter units taken in *each* of the following areas: 1) English and communication studies, 2) social sciences, 3) humanities and fine arts, including foreign languages, 4) mathematics and the physical and life sciences. Students who do not wish to become humanities majors, but wish to obtain a Multi-Subject Credential, will be required to take the Commons Examination which will consist of subject matter in the four categories listed above. In addition to professional education courses, students will be required to accomplish student teaching, and a knowledge of teaching methodology in reading must be demonstrated, either through completing a course or passing an examination.

A student who wishes to qualify for a Multi-Subject credential and follow another major, may do so by meeting the course requirements for the humanities major, in addition to his major course requirements.

Note that the requirements will be the same as for a declared humanities major, i.e., 32 quarter units taken in (1) English and communications, (2) social sciences, (3) humanities and fine arts, including foreign languages and (4) mathematics and the physical and life sciences.

When the student completes the above requirements, the student should seek verification of this fulfillment from the Director of Humanities Majors (Elementary Education). By completing the above requirements, the student will be exempt from taking the Commons Examination.

Admission requirements for the credential program are as follows:

1. Academic achievement: the candidate must have an overall grade point average of 2.75 and 3.0 in the major. The candidate must possess an acceptable major, that is, one which the University of Santa Clara is approved to recommend for a credential.
2. Mental, emotional and physical fitness.

3. A positive attitude toward the teaching profession and its responsibilities.
4. A demonstrated competence in reading, writing, and speaking English as attested to by course work or at least two full-time faculty members.
5. A written statement confirming absence of criminal conviction that would preclude the issuance of a credential.
6. Written recommendations: three letters of recommendation from any of the following:

   University of Santa Clara professors from the student's major field, former employers, professional persons, teacher in elementary or secondary schools under whom the student has completed practicum work.
7. Interviews: with the Director of Teacher Education and another full-time faculty member of the Education Department.
8. Verification of successful practicum work and/or experience with children or youth groups.

Final Deadline for admission: May 1, for Fall Quarter entry.

Since the Teacher Education Program is limited in enrollment, accepted candidates must reserve a place in the program by depositing $50 before June 1. This nonrefundable deposit will be applied to the candidate's tuition.

THE GENERAL HUMANITIES MAJOR WITH AN EMPHASIS IN BILINGUAL EDUCATION

The General Humanities Major with an Emphasis in Bilingual Education can provide an excellent major for the student interested in a teaching career in bilingual education. Its flexibility allows the student to take a broad range of courses which provide preparation for teaching all subject matter areas in the elementary classroom in addition to developing skills in Spanish and English communication.

Overview of the Program:

A General Humanities Major who is interested in a bilingual teaching career is required to take a minimum of 32 quarter units in each of the four categories required by the Ryan Act, i.e., English, social science, humanities/fine arts, and math/science. Included in the English category are courses in English composition, grammar, linguistics, literature, and speech. Included in the social science category are courses in history, psychology, sociology, anthropology, economics, and political science. Included in the humanities/fine arts category are courses in Spanish, music, art, philosophy, religious studies, and drama. Included in the math/science category are courses in mathematics, accounting, natural and physical science and scientific courses in other departments.

Program Objectives:

The objectives for students in the General Humanities Major with an Emphasis in Bilingual Education are the following:

A) To complete the courses required for fulfillment of the "liberal/diversified major" as designated by the Ryan Act.

B) To attain levels of proficiency in Spanish listening, speaking, reading, and writing skills, in order to obtain a Certificate of Bilingual Proficiency.

C) To engage successfully in field experience in the bilingual classroom.

For additional information regarding admission and proposal acceptance, contact the Director of Bilingual Education in the Education Department.

99/199. PRACTICUM IN EDUCATION
Opportunity for working as teacher-aides. Includes discussion seminars and directed readings. Permission of instructor required.

12/112. EDUCATION IN AN ERA OF CHANGE
An analysis of the status and direction of American education in the middle decades of the twentieth century. Stress is placed upon examining the nature and conditions of current school conflict and recent criticisms of the public school system.

19/119. PSYCHOLOGY OF EDUCATION
Introduction to theories of learning and their implementation in the classroom. The construction and uses of criterion-referenced objectives and their effects on learning. Testing and measurement concepts as they apply to classroom evaluation. Some problems confronting academically and socially disadvantaged students and techniques for alleviating these.

120. DIRECTED TEACHING I (Fall quarter)-(4)
This is the first in a student teaching sequence of three courses which is designed to introduce the Teacher Credential candidate to curriculum and instruction in the public schools at all levels. Morning practicums are combined with weekly seminars in which students have an opportunity to discuss problems and issues in public education. Prerequisite: Admission to the Teacher Credential Program.

121. DIRECTED TEACHING II (Winter Quarter)-(5)
The second course in the directed teaching sequence is designed for the Teacher Credential candidate who will engage in teaching under the supervision of an experienced resident teaching in the public schools. Students are assigned to specific teaching position in the morning while taking coursework in the afternoon, thereby facilitating the inter-relating of theory and practice. Prerequisite: Admission to the Teacher Credential Program and completion of ED 120.

122. DIRECTED TEACHING III (Spring Quarter)-(15)
The last course in the directed teaching sequence is designed as a continuation of ED 121. Students continue their student teaching assignments until the completion of the public school year while taking coursework in the afternoon. Prerequisite: Admission to the Teacher Credential Program and completion of ED 120 and 121.

150. FOUNDATIONS OF EDUCATION I (4)
The first of three courses stressing the theoretical bases of education. Designed to develop a carefully considered point of view toward teaching and learning. Value questions which relate to psychology and curriculum are considered. Prerequisite: Admission to the Teacher Credential Program.

151. FOUNDATIONS OF EDUCATION II (4)
The second of the three course sequence concentrates on the applications of psychology to the educational process. Consideration of standardized and teacher constructed tests is also included. Prerequisite: Admission to the Teacher Credential Program.

152. FOUNDATIONS OF EDUCATION III (7)
This third of three courses focuses on curriculum design, implementation, and evaluation at the elementary and secondary levels. Students are given an opportunity to pursue their special interests related to such problems as the core curriculum, psychology of curriculum, subject- vs. student-centered approaches, and recent trends in the field. Prerequisite: Admission to the Teacher Credential Program.

63/163. INTRODUCTION TO TEACHING IN A MULTI-CULTURAL SOCIETY
Introduces the student to public school curriculum and instruction in a multi-cultural setting. Students are engaged in directed practicums while participating in seminar sessions which focus on cultural learning styles, bilingual/bicultural programs; components of multi-cultural curriculums, and other field-related problems and issues.

184. READING IN THE ELEMENTARY SCHOOL
A survey and study of approaches, methods, and practices in reading instruction. Prerequisite (for undergraduate only): Admission to the Teaching Credential Program.

COLLEGE OF HUMANITIES
DEPARTMENT OF THE CLASSICS

George Sullwold, Jr., Ph.D., *Acting Chairman*

Professor: George Sullwold
Associate Professor: Walter Kropp, S.J.
Assistant Professor: Helen E. Moritz

A student, after consultation with any member of the department faculty, may take any course for credit which suits his needs and preparation.

MAJOR: The Department of the Classics does not offer a major, but a student may take the Humanities Major and specialize in any one of four programs in The Classics: Latin, Greek, Latin and Greek, or Classical Studies. Twelve courses are necessary for any one of the programs.

Greek

1. ELEMENTARY GREEK I
For beginners. Reading in Attic Greek is combined throughout with the learning of forms, vocabulary, and syntax.

2. ELEMENTARY GREEK II
Continuation of 1.

21. INTERMEDIATE GREEK I
Xenophon and/or Plato. Prose Composition. Prerequisite: 2.

22. INTERMEDIATE GREEK II
Continuation of 21.

100. HOMER I, Selections

101. HOMER II, Selections

111. EURIPIDES I

112. EURIPIDES II

113. SOPHOCLES I

114. SOPHOCLES II

119. THUCYDIDES

120. HERODOTUS

125. COMPOSITION I

130. PLATO

131. THE ART OF ANCIENT GREECE

140. AESCHYLUS

150. THE ORATORS

170. LYRIC POETRY

171. PINDAR

199. DIRECTED READING

Latin

Students who have entered Santa Clara with Latin credit should consult with a member of the department to determine at what stage they should begin here.

1. ELEMENTARY LATIN I
For beginners. Reading in Latin is combined throughout with the learning of forms, vocabulary, and syntax.

2. ELEMENTARY LATIN II
Continuation of 1.

21. INTERMEDIATE LATIN I
Grammar, syntax, readings.

22. INTERMEDIATE LATIN II
Selected readings from Latin authors.

100. CAESAR, Selections

105. CICERO, Selected Philosophical Dialogues

106. CICERO, Orations and Rhetoric

110. TERENCE AND/OR PLAUTUS

119. VERGIL, Eclogues and Georgics

120. VERGIL, Selections from the Aeneid

125. COMPOSITION I

140. HORACE, The Odes and Epodes

145. ROMAN SATIRE

150. OVID, Selections

155. ELEGIAC POETS

160. TACITUS

180. LUCRETIUS

199. DIRECTED READING

COLLEGE OF HUMANITIES
DEPARTMENT OF ENGLISH

Francis X. Duggan, Ph.D., *Chairman*

Professors: James P. Degnan, Francis X. Duggan
Associate Professors: John H. Gray, S.J., Christiaan Lievestro, Charles T. Phipps, S.J., George J. Sullwold, Elizabeth J. Moran
Assistant Professors: Diane D. Dreher, Jesse M. Gellrich, Edward D. Gross, Felton G. O'Toole, S.J., Theodore Rynes, S.J., Richard M. Schmidt, Joseph Subbiondo, Frederick Tolllini, S.J.
Lecturers: Mary Ann Aschauer, Carol Rossi, Jeffrey L. Zorn

Bachelor of Arts

The departmental course requirement for an English major is 5 lower-division English courses, in addition to the 2 composition courses required by the College of Humanities, and 8 upper-division English courses. Students are advised to choose their courses from within one of the programs described below.

Lower-division requirements:

Except as noted for Programs C and F, lower-division course requirements for all programs are any 5 courses from the following 6:

21, 22, 23 The Nature of Literature

61, 62, 63 Literature of the Western World

The Literature of the Western World, which is one of the "core curriculum" sequences in the College of Humanities, does not satisfy the core curriculum requirements for English majors who must follow a core curriculum sequence in some other department in the Humanities.

Program A: English Literature

Program A is the standard English Major designed for students planning to continue their study beyond the B.A. degree. It is also a good program for the general student. Its distinctive feature is that it concentrates on major authors, theory, and the earlier periods of English literature. Upper-division requirements are 8 upper-division courses distributed as follows:

3 period courses from 155 (or 152), 156 (or 116, 117, 118), 159, 160, 161.
2 major authors (Chaucer, Shakespeare, Milton): 116, 117, 118, 152, 158.
1 literary theory: 104 or 187.
The remainder from other upper-division literature courses.

Program B: General English

Program B, although it also meets entrance requirements for graduate schools in English, is a more general program. It is especially suitable for students planning to obtain teaching credentials, to do further study in journalism or language and linguistics, or to enter law school. The heart of the program is a three-course sequence in closely related subjects. The 8 upper-division courses should be distributed as follows:

1 in major authors (Chaucer, Shakespeare, Milton): 116, 117, 118, 152, 158.
3 courses from one of these nine groups:
a. Language and linguistics: 101-103.
b. Writing: 171-179.
c. Fiction: 134, 146, 164, 165.
d. Drama: 110-119.
e. American literature: 119, 130-134, 149.
f. Medieval literature: 103, 152, 155.
g. Renaissance literature: 113, 116, 117, 118, 156, 158.
h. Other periods: 112, 114, 159-162, 167.
i. Comparative literature: 110, 112, 144, 145, 146, 147, 148, 155.
4 other upper-division English courses. Especially recommended: 104.

Program C: American Literature

Program C is designed for students with a special interest in their American heritage. It is suitable for pre-law students as well as for the general student. A number of universities offer graduate programs in American Studies.

Lower-division requirement: 5 courses from 2 sequences.
Either 2 or 3 of these courses must be in the Nature of Literature (21, 22, 23); the other 2 or 3 may be in *either* the Survey of American Literature (36, 37, 38) or the Literature of the Western World (61, 62, 63).
Upper-division requirement: 8 courses distributed as follows:
4 from 119, 130-134, 149.
4 other upper-division English courses.

Recommended lower-division or upper-division electives: courses in American history, philosophy, religion, political science, sociology, or economics.

Program D: Dramatic Literature

Program D is a cooperative program of the Departments of English and Theater Arts. It is recommended for students interested in drama and intending to continue study or to enter a professional career in drama, dramatic literature, dramatic criticism or journalism. Though not recommended for students planning graduate study in English literature in general, the program is suitable for those planning to obtain a teaching credential or an MAT in English. Upper-division courses should be distributed as follows:

4 from 110, 112, 113, 114, 119, 186.
1 Shakespeare: 116, 117, 118.
3 other upper-division courses in English or Theater Arts.

Program E: Comparative Literature

Program E is designed for the student whose interests in literature go beyond English and American literature. It is especially suitable for students taking a junior year abroad and is excellent preparation for teaching and graduate study. Upper-division course requirements are the following:

English 144 and 145.
2 from English 104, 146, 147, 148, 155.
4 upper-division courses in the literature of a foreign language; courses in language or linguistics do not meet this requirement.
Recommended:
Courses in a second foreign language, preferably Latin or Greek.
Upper-division English electives, especially 116, 117, 118, 152, 158.

Program F: Writing

Program F is intended for the student planning further study or professional work in journalism or other types of writing.

Lower-division requirements:
Same as for Programs A, B, D, and E, except that 2 courses from the groups 71, 73, 74 may be substituted for two courses in the sequences 21, 22, 23 and 61, 62, 63.
Upper-division requirements:
4 from 170-179.
4 other upper-division English courses.

Program G: Single-Subject Credential or "Waiver" Program

The State requirement of a standard written examination for the single-subject teaching credential in California will be waived for students following this program.

Upper-division requirements.
English courses: 8 including:
2 in language and linguistics from 101, 102, 103.

2 American literature: 119, 130-34, 149.
1 Shakespeare: 116, 117, 118.
1 in ethnic literature: 148, 149.
1 in composition: 178.

Note: Requirements in Shakespeare, American literature, and ethnic literature may be met in lower-division courses 36, 37, 38, 44, 48, 49, but without reducing the requirement of 8 upper-division English courses for an English major.

Courses in other departments:
Theater Arts 1 or 63.

Honors Program

Students majoring in English may participate in the University Honors Program. The Department of English offers special courses or sections of courses restricted to Honors students. It also permits Honors students majoring in English to begin in their sophomore year taking courses ordinarily restricted to juniors and seniors.

1. COMPOSITION AND RHETORIC I
Expository writing for college students. Readings in selected modern essays. NCX*

2. COMPOSITION AND RHETORIC II
Argumentation and research writing. Readings in selected modern essays. NCX*

3. COMPOSITION AND LITERATURE
Continued practice in composition through critical and research writing on literary topics. Readings in imaginative literature. NCX*

4, 5. GUIDED WRITING I, II
Courses in composition for native American students with special linguistic problems. Substitutes for English 1 and 2. NCX*

9, 10. CRITICAL COMPOSITION I, II
Composition in literary topics for freshmen in the University Honors Program. Substitutes for English 1 and 2. NCX*

11, 12, 13. ENGLISH FOR FOREIGN STUDENTS
English for non-native speakers. The courses begin with reading and aural comprehension and progress through written composition. English 11 and 12 substitute for English 1 and 2. NCX*

21, 22, 23. THE NATURE OF LITERATURE I, II, III
Introduction to the study of literature through critical reading of and writing about imaginative literature in various genres, modes, and styles. The

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*Exempted from challenge.

courses concentrate respectively on lyric and epic, comedy and tragedy, realism and romance. Prerequisites: Eng 1 and 2.

36, 37, 38. SURVEY OF AMERICAN LITERATURE I, II, III
Historical study of American literature from colonial times to the present.

43. POETRY
Introductory study of English lyric and short narrative poetry.

44. SHAKESPEARE
Readings in the major tragedies, comedies, and chronicle plays.

48. AFRICAN LITERATURE
See English 148.

49. AFRO-AMERICAN LITERATURE
See English 149.

60. INTRODUCTION TO DRAMA
See Theatre Arts 60.

61, 62, 63. LITERATURE OF THE WESTERN WORLD I, II, III
Historical survey of Western literature from the ancient Greeks to the 20th century. Satisfies the "core curriculum" requirement of the College of Humanities.

65. MYTHOLOGY
A study of classical mythology, with consideration of literary, psychological and anthropological implications.

67. MODERN NOVEL
Readings in selected twentieth-century novels, chiefly from continental European literatures.

71. CREATIVE WRITING
Introduction to the writing of poetry and fiction. NCX*

72. EXPOSITION
Intermediate course in the techniques of expository writing. Prerequisites: Eng 1 and 2. NCX.

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*Exempted from challenge.

73. WRITING AND RESEARCH
Methods of gathering, organizing, and presenting material available in books, articles, and other sources. Regular writing assignments including at least one major research paper. Prerequisite: Eng 1 and 2. NCX*

74, 75. JOURNALISM
Writing for newspapers and magazines, with special emphasis on feature and editorial writing. Prerequisites: Eng 1 and 2. NCX*

81, 82, 83. LITERARY TOPICS I, II, III
Studies of special topics in literature.

101. LINGUISTICS
General survey of the science of linguistics: phonology, morphology, syntax, grammar, and usage.

102. MODERN GRAMMAR
Analysis of the basic problems of describing grammatical structure; traditional, structural, and transformational-generative grammars.

103. HISTORY OF THE ENGLISH LANGUAGE
The origin, structure, and development of the English language. Special attention to the morphology and syntax of Old English.

104. THEORY OF LITERATURE
Study of literary theory from Aristotle to the present.

110. CLASSICAL AND NEO-CLASSICAL DRAMA
Greek, Roman, and continental neo-classical plays in translation. Aeschylus, Sophocles, Euripides, Aristophanes, Seneca, Corneille, Racine, Moliere.

112. MODERN DRAMA
See Theater Arts 112.

113. ENGLISH DRAMA I
Non-Shakespearean drama in England to 1660: Medieval drama, Marlowe, Ford, Webster, Jonson.

114. ENGLISH DRAMA II
Drama in England since the Restoration. Dryden, Wycherley, Congreve, Sheridan, Shaw, Eliot, and selected contemporary playwrights.

116. SHAKESPEARE'S TRAGEDIES

117. SHAKESPEARE'S COMEDIES

118. SHAKESPEARE'S HISTORIES AND SONNETS

119. AMERICAN DRAMA
See Theatre Arts 119.

130, 131, 132. STUDIES IN AMERICAN LITERATURE I, II, III
Intensive studies of selected authors, movements, or problems in American literature.

133. AMERICAN POETRY
Historical study of American poetry. Taylor, Bryant, Poe, Emerson, Longfellow, Whitman, Dickinson, Robinson, Frost, Eliot, Stevens.

134. AMERICAN NOVEL
Historical study of the American novel. Cooper, Hawthorne, Melville, Twain, James, Dreiser, Faulkner.

144, 145. COMPARATIVE LITERATURE I, II
Studies in the forms, themes, and styles of continental European literature and their influence on English literature.

146. MODERN FICTION
Selected works of continental, English, and American fiction that are peculiarly "modern" in sensibility or style. Flaubert, James, Proust, Joyce, Gide, Kafka, Mann, Woolf, Faulkner.

147. THE BIBLE AND LITERATURE
Selected readings in the Old and New Testaments. Attention to the history, theology, and nature of narrative forms in both Testaments. Biblical writing contrasted with mythology and fiction.

148. AFRICAN LITERATURE
Contemporary literature of Black sub-Sahara Africa. Achebe, Soyinka, Mphahele, Abrahams, Ngugi, Tutuola.

149. AFRO-AMERICAN LITERATURE
Literature of Black America in the 20th century. Toomer, Wright, Ellison, Kelley, Gaines, Demby, Ward, Baldwin, Jones.

152. CHAUCER

155. MEDIEVAL LITERATURE
A study in translation of English literature from the Norman Conquest to 1485. Beowulf, medieval drama, Sir Gawain, Langland, Chaucer, Malory.

156. RENAISSANCE
Non-dramatic literature of England from 1485 to 1660. Sidney, Spenser, Jonson, Donne, Herbert, Herrick, Milton, Marvell.

158. MILTON

159. NEO-CLASSICAL LITERATURE
Literature of England from 1660 to 1798. Dryden, Pope, Swift, Johnson, Boswell.

160. ROMANTIC MOVEMENT
Non-dramatic literature of England from 1798 to 1832. Blake, Burns, Wordsworth, Coleridge, Byron, Shelley, Keats.

161. VICTORIAN LITERATURE
Non-dramatic literature of England from 1832 to 1900. Carlyle, Newman, Tennyson, Browning, Ruskin, Morris, Arnold, Pater.

162. MODERN ENGLISH LITERATURE
The non-dramatic literature of England in the 20th century. Wilde, Hardy, Hopkins, Conrad, Yeats, Lawrence, Eliot, Auden, Graves, Forster, Woolf, MacNeice, Thomas.

164. ENGLISH NOVEL I
The English novel in the 18th Century. Defoe, Richardson, Smollett, Sterne, Fielding, Austen.

165. ENGLISH NOVEL II
The English novel in the 19th Century. Scott, the Brontes, Dickens, Thackeray, Trollope, Eliot, Meredith, Butler.

167. CELTIC RENAISSANCE
Irish literature in English of the late 19th and the 20th centuries. Yeats, Synge, Russell, Lady Gregory, Colum, O'Casey, Stephens, Joyce, O'Connor, O'Faolain.

170. PLAYWRITING
See Theater Arts 170. NCX*

171. FICTION WRITING
A workshop in the writing of fiction, with emphasis on the short story. Prerequisites: Eng 1 and 2. NCX*

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*Exempted from challenge.

172. POETRY WRITING
A workshop in the writing of poetry. Prerequisites: Eng 1 and 2. NCX*

173. ADVANCED COMPOSITION
Exposition, argument, description, and narration. For juniors and seniors desiring to improve their writing skills. NCX*

174, 175. MAGAZINE JOURNALISM I, II
Workshops in writing for magazines and periodicals. English 174 treats profile, argumentative essay, essay review, and satirical essay. English 175 treats in-depth and investigative reportage. Prerequisites: Eng 1 and 2. NCX*

176. WRITERS' WORKSHOP
Workshop and tutorial for students with demonstrated superior talent in fiction and non-fiction. Enrollment by permission of the instructor. NCX*

177. ARGUMENTATION
Deductive, inductive, and persuasive writing. Recommended for pre-law and other pre-professional students planning careers requiring skill in these forms of writing. Prerequisites: Eng 1 and 2. NCX*

178. WRITING FOR TEACHERS
A course in writing and in the teaching of writing. Recommended for students planning careers in primary or secondary education. Prerequisites: Eng 1 and 2. NCX*

179. PRACTICUM IN WRITING
Internships on newspaper, magazines, or other publications; for students with demonstrated superior ability. NCX*

181. SENIOR SEMINAR
A seminar in English or American literature for senior English majors. Admission by invitation or permission of the instructor. NCX*

182. HONORS SEMINAR
A seminar in literature for students in the University Honors Program. NCX*

183, 184, 185. SPECIAL TOPICS IN LITERATURE I, II, III
Courses in major authors, literary movements, or themes.

186. SPECIAL TOPICS IN DRAMA
See Theater Arts 186.

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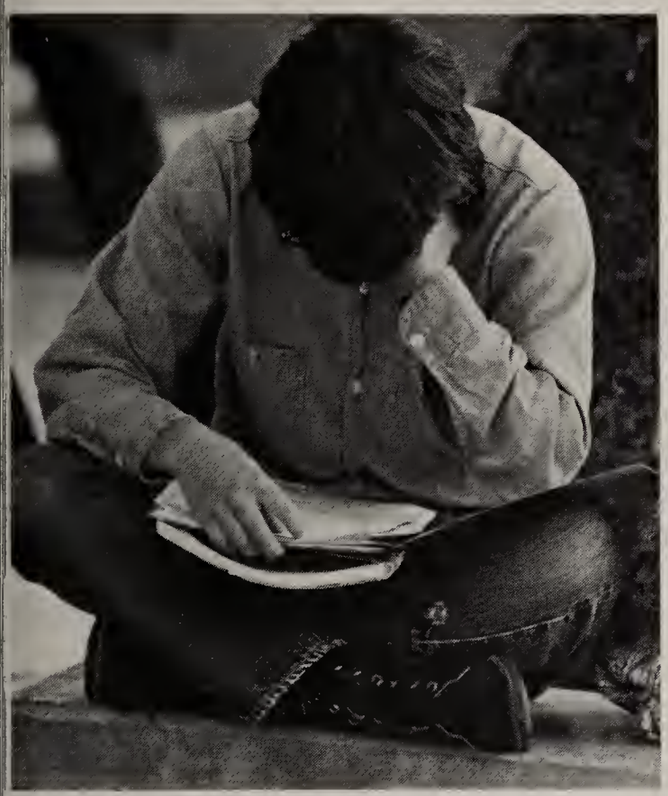
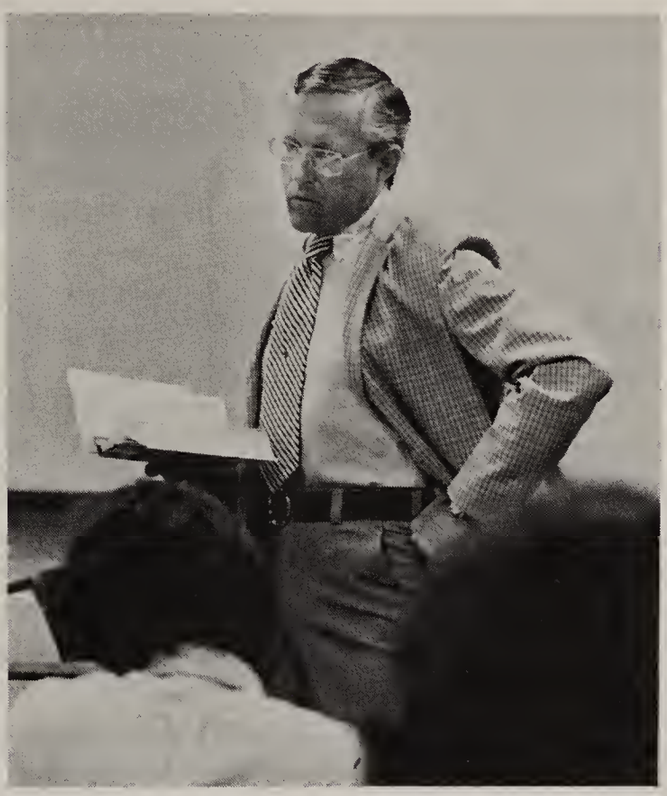
*Exempted from challenge.

187. SPECIAL TOPICS IN LITERARY CRITICISM

199. INDEPENDENT STUDY

Under special circumstances and with the permission of the Department Chairman a student may request of an instructor a course in directed reading or writing. Independent study may not be taken in a subject in which a course is currently available. NCX*





COLLEGE OF HUMANITIES
DEPARTMENT OF FINE ARTS

Gerald P. Sullivan, S.J., S.T.M., *Acting Chairman*

Assistant Professors: Irvin S. Tepper, Brigid S. Barton
Lecturer: Gerald P. Sullivan, S.J.
Adjunct Lecturer: Keith Walker

The Fine Arts Department offers a major program in Fine Arts with an emphasis in the Studio or in Art History. In addition to the University and College requirements, art majors must complete thirteen courses in the department with an average grade of C.

The requirements for a Studio emphasis are three lower-division Studio courses, and two lower-division Art History courses; six upper-division Studio courses, and two upper-division Art History courses.

The requirements for an Art History emphasis are the lower-division Art History sequence (71, 72, 73), and two lower-division Studio courses; six upper-division Art History courses, and two upper-division Studio courses.

Art majors should select one Core Curriculum sequence outside the major from either World Literature, Western Civilization, or the History of Philosophy.

Proper credentials will admit students to the art facilities until 10:30 p.m. during the school term. A lab fee may be required for all Studio courses to help defray the cost of materials.

In addition to the faculty and facilities of the Fine Arts Department, the University provides the programs of the De Saisset Art Gallery on campus. The many galleries and museums in the Bay Area are readily accessible to the students of the University.

10, 11. BASIC PHOTOGRAPHY

Introduction to photography as a creative art form. Includes study and practice of various techniques and equipment. Extensive work is required in the darkroom with an emphasis on creative expression.

21, 22, 23. BASIC FILM MAKING

Introduction to the theory and practice of film making as a creative form of expression. Course covers the various production techniques of Super-8 film.

26, 27, 28. BASIC VIDEO

An introduction to America's first truly indigenous art form. Emphasis is on actual production of video art using portable and studio equipment.

31, 32, 33. BASIC DRAWING

Introduction to various drawing media and techniques as well as to the problems of self-expression involved in classical and contemporary drawing.

41, 42, 43. BASIC PAINTING

Introduction to the basic skills and concepts requisite for self-expression in painting media with an emphasis on color and composition as used for creation in two dimensional art forms.

51, 52, 53. BASIC CERAMICS

Introduction to three dimensional problems, materials, and techniques including hand-building, mold-making, glazing, and firing.

54, 55, 56. SCULPTURE

Introduction to the fundamentals of art in a three dimensional form, including materials and techniques as well as the problems of expression peculiar to this art.

60. PRINTMAKING

Introduction to a selection of techniques applied to the art of printmaking such as woodcuts, and collography.

61, 62, 63. BASIC SILKSCREEN

The techniques and concepts requisite for making silkscreened prints as an art form.

64, 65, 66. BASIC LITHOGRAPHY

Introduction to the techniques and concepts requisite for lithography (printing from a stone) as an art form.

67, 68, 69. BASIC ETCHING

An intaglio printing technique on metal plates through a creative process of drawing, etching with acids, and printing.

71. ART HISTORY I: ANCIENT THROUGH MEDIEVAL

This course with 72 and 73 constitutes a Core Curriculum sequence, but can be taken separately. This is a study of the civilizations of the ancient and medieval world with strong interdisciplinary emphasis. Major monuments such as the Parthenon and certain Gothic cathedrals will be treated in greater depth.

72. ART HISTORY II: RENAISSANCE THROUGH BAROQUE

This course with 71 and 73 constitutes a Core Curriculum sequence, but can be taken separately. A survey of the painting, sculpture, and architecture of the period from the Renaissance through the Baroque with a strong interdisciplinary emphasis. The art of Leonardo da Vinci, Michelangelo, Bernini, Rembrandt, and Rubens will be studied in greater depth.

73. ART HISTORY III: ROCOCO THROUGH CONTEMPORARY

This course with 71 and 72 constitutes a Core Curriculum sequence, but can be taken separately. A survey of painting, sculpture, and architecture

from the Eighteenth Century to the present with an interdisciplinary emphasis. The art of Watteau, David, Courbet, Picasso, and Dali will be analyzed in greater depth.

97. CREATIVE PROJECTS

A course for lower division students who want to do an art project not covered in the catalogue. This will be under the direction of one or more of the Fine Arts Faculty. There will be group meetings with the teacher to discuss progress.

101, 102, 103. ADVANCED PHOTOGRAPHY

Study of photography as creative, individual expression in a number of contemporary forms such as color photography, multiple images, and 3-D. Extensive studio work required in addition to readings in the nature of the photographic image and its history. Prerequisite: Basic 10 or 11.

121, 122, 123. ADVANCED FILM MAKING

Continuation of the theory and practice of Super-8 film making stressing the achievement of personal style under direction. Prerequisite: 21, 22, or 23.

126, 127, 128. VIDEO AS AN ART FORM

Continuation of the basic course with emphasis on personal approach and idea orientation. Prerequisite: Permission of the Instructor.

131, 132, 133. LIFE DRAWING

Drawing from life in various media stressing the techniques of composition, knowledge of anatomy, and the possibility of creative drawing. Prerequisite: 31, 32, or 33.

141, 142, 143. ADVANCED PAINTING

Involves working in the various styles and techniques of painting to find personal styles and manner of self-expression. Prerequisite: 41, 42, or 43.

151, 152, 153. ADVANCED CERAMICS

A continuation of the basic course with emphasis on personal style and self-expression. Prerequisite: 51, 52, or 53.

154, 155, 156. ADVANCED SCULPTURE

A continuation of the basic course in sculpture. Prerequisite: A Basic Sculpture or Ceramic course.

160. ADVANCED PRINTMAKING

A continuation of the basic course. Prerequisite: Drawing or any Basic Printmaking course.

161, 162, 163. ADVANCED SILKSCREEN

A continuation of the basic course. Prerequisite: Drawing or any Basic Printmaking course.

164, 165, 166. ADVANCED LITHOGRAPHY

A continuation of the basic course. Prerequisite: Drawing or any Basic Printmaking course.

167, 168, 169. ADVANCED ETCHING

A continuation of the basic course. Prerequisite: Drawing or any Basic Printmaking course.

170. ANCIENT ART

Analysis of the visual arts and culture of the ancient world with special emphasis upon Greek art.

174. MEDIEVAL ART

Analysis of the visual arts and culture in the Medieval period with special emphasis upon the Gothic.

175. ITALIAN RENAISSANCE ART

A study of the visual arts in Italy in the Fifteenth and early Sixteenth centuries. Individual artists such as Michelangelo, Leonardo da Vinci, Botticelli, or Masaccio may be singled out for more detailed study.

176. NORTHERN ART IN THE RENAISSANCE PERIOD

A study of the visual arts in northern Europe during the periods of the 'Late Gothic' and Northern Renaissance. The work of Jan van Eyck, Hieronymous Bosch, Pieter Bruehgel the Elder, and Albrecht Dürer will be studied in greater depth.

178. BAROQUE ART

A survey of the art of the Seventeenth Century throughout Europe, including painting, sculpture, and architecture. Special emphasis will be given to Rembrandt, Rubens, Bernini, and Velasquez.

183. NINETEENTH CENTURY ART: 1780-1880

A study of the movements of Neoclassicism, Romanticism, and Realism in the context of Nineteenth Century culture. The work of David, Delacroix, Courbet, and the Impressionists will be studied in greater detail.

184. TWENTIETH CENTURY ART: 1880-1940

An analysis of Post-Impressionism, Cubism, Expressionism, Surrealism, and other important modern movements with emphasis upon Cezanne, Picasso, Kandinsky, Duchamp, and Dali.

185. CONTEMPORARY ART: 1940-1970's
A survey of contemporary developments in the arts from Abstract Expressionism to the present, including photography, ceramics, and the more traditional arts of painting, sculpture, and architecture.

186. EARLY MODERN: 1880-1914
A more specialized course dealing in depth with artistic trends during 'La Belle Epoque'.

187. MODERN AND CONTEMPORARY: 1918-PRESENT
A more specialized course dealing in depth with artistic problems between and after the two world wars. The focus will be on either the Bauhaus, Surrealism, Realism between the wars, or upon post-war art, depending upon the quarter offered.

188. ARCHITECTURE
A study of one or more periods of architecture, i.e., Ancient, Medieval, Baroque and Modern.

197. DIRECTED CREATIVE RESEARCH
A seminar for advanced students who want to do an art project not covered by the courses in the catalogue under the direction of one or more members of the Fine Arts Faculty and are willing to meet in a group to discuss their progress with each other and with the teacher leading the seminar.

199. DIRECTED STUDY
Tutorial work in the areas of Art History or Studio Art. By permission of the Chairman of the Fine Arts Department.

COLLEGE OF HUMANITIES
THE B.A. IN GENERAL HUMANITIES

Bernard Brown, S.J., Ph.D., *Director*

Gerald McDonald, Ed.D., *Director of General Humanities for Secondary Education*

General Humanities Committee: B. Brown, S.J., *Chairman;* B. Barton, H. Breidenbach, B. Brown, S.J., F. Jiménez, I. Mocsy, F. Tollini, S.J.
Advisor, General Humanities for Secondary Education: Jo Ann Vasquez

The Bachelor of Arts in General Humanities has been established for those students who judge that none of the traditional single-subject majors fulfill their educational ambitions. A student enrolled in this program composes his own curriculum with the assistance of a faculty advisor. Subjects now offered in the College of Humanities must predominate in the curriculum, but subjects from the other Colleges may well be integrated into it.

The student may select any one of three kinds of curriculum:

(1) an interdisciplinary curriculum emphasizing two or more closely related subjects (e.g., history, literature, and sociology of a specific country or culture; aesthetics; philosophy of religion; art history, with background in foreign language and history; dance therapy).

(2) an entirely original curriculum emphasizing a new discipline or major created by the student himself (e.g., technical writing, Communications or Ethnic Culture in some specified form).

(3) a "humanities core" curriculum emphasizing several of the Humanities subjects rather than a single departmental subject. This type of program will generally be reserved for pre-law students or for students intent upon elementary school teaching (see Multi-Subject Credential, page 52).

This degree program adds a new flexibility to the educational structure at Santa Clara. It gives the student a distinct voice in the decision-making process affecting his own education, for the only courses binding on him in advance, as he sits down to plan his proposal, are those listed among the general University and College requirements.

ADMISSION

Any student in good standing who has completed at least one full term at Santa Clara may apply for admission to this degree program. The ideal time to apply is during Sophomore year. No program will be accepted after second quarter of Junior year. In other words, at time of application a student's transcript should not add up to more than 115 quarter units. Proposal forms are available in the office of the Director of the General Humanities program and in that of the Dean of Humanities. Students intent upon elementary education should see the special Director for that program.

A student wishing to be admitted into General Humanities will, in consultation with an advisor of his own choosing from the Humanities College faculty, devise his own curriculum proposal. Each proposal should offer a sound and challenging curriculum of integrated courses; free electives may be part of such a curriculum. The student should plan at least fourteen upper division courses. In the interests of flexibility it is suggested too that if the student plans, let us say, three upper division Philosophy courses, he specify five or six appropriate ones from which the three may be chosen as future scheduling permits.

Each curriculum proposal must begin with a clear statement of learning objectives (career plans may, but need not, enter into this). The Committee, in its deliberations, considers these statements very closely. Vague statements about human communications or personal development or learning about people will not satisfy.

In its completed form the curriculum proposal, signed by the student and his advisor, is submitted to the Director who in turn circulates it to the members of the General Humanities Committee for their quarterly meeting. If approved by the Committee, the proposal is forwarded to the Dean for his authorization; copies are then filed in the office of the Registrar. If disapproved, the proposal will be returned to the student with a brief explanation of what was found wanting, which in some cases may be remedied and in some cases not.

An approved curriculum will be considered binding on both student and University. Once the student has completed the curriculum, he will be awarded the B.A. degree in Humanities. It is the student's responsibility to complete the curriculum exactly as approved, though subsequent changes may be authorized by the Director.

COLLEGE OF HUMANITIES
DEPARTMENT OF HISTORY

Matt S. Meier, Ph.D., *Chairman*

Professors: Norman F. Martin, S.J., Matt S. Meier
Associate Professors: E. Thadeus Flood, Steven M. Gelber, Timothy J. O'Keefe
Assistant Professors: Donald F. Crosby, S.J., Mary McDougall Gordon, Miles M. Merwin, Istvan I. Mocsy, Peter O. Pierson, David E. Skinner
Acting Assistant Professor: Thomas P. Turley
Lecturers: Susan Groag Bell, George F. Giacomini

Students who wish to make History their major subject, besides completing the University and College requirements, must pass twelve courses in History with an average grade of C. The major program must include four lower division and eight upper division term courses. The latter must be taken during the student's last two years. In order to assure breadth in Historical studies the History major should take a minimum of three courses in each of the following broad areas: United States, European, and non-Western/Latin American History. One seminar (98 or 198) must be taken as part of the required courses. It is strongly recommended that History 4, 5 and 6 be taken by all students who have not had a comparable course in high school.

Honor sections and upper division Independent Study Courses are offered. Senior Honors students who possess the necessary qualifications may be admitted to graduate seminars by special permission of the chairman and the instructor.

Courses bearing both upper and lower division numbers require substantially more work from upper division students.

***4, 5, 6. WESTERN CIVILIZATION**
An interdisciplinary survey of Western culture and civilization from its beginning to the present, emphasizing the institutions and historical patterns which have shaped modern civilization.

8, 9. UNITED STATES SURVEY
A history of the United States tracing the major political, social, economic and expansionist trends from colonial origins to recent times.

10/110. EUROPEAN CULTURE AND SOCIETY
A brief introduction to European culture and civilization from the end of the Middle Ages to the beginning of the Twentieth Century. Chief emphasis will be on the relationships of cultural forms, in the sense of letters, the fine arts and music, and social developments.

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*This three course sequence may be taken by all non-History majors to fulfill the requirements of the humanities core curriculum. It is open to all students.

11, 111. THE CLASSICAL MEDITERRANEAN WORLD

The Hellenic world from Homer to Alexander the Great. Hellenistic Civilization; Rome from republican city to world empire; late antiquity.

12, 112. MEDIEVAL EUROPE

The Roman Empire and the Barbarians in Western Europe; Byzantine and Islamic impact; the Carolingian empire; feudalism and the Viking age; Papacy; Empire and Feudal monarchies; Renaissance of the twelfth century; the high Middle Ages.

13, 113. RENAISSANCE AND REFORMATION, EUROPE 1350-1610

Autumn of the Middle Ages: the Renaissance as a cultural movement; the religious upheaval and its consequences; Europe and the Ottoman Empire; overseas expansion and the price revolution; Europe divided.

14, 114. THE AGE OF REASON AND THE OLD REGIME, EUROPE, 1610-1789

Continuation of religious and dynastic struggles; advance of scientific thought and its consequences; church, state and social structure; world empires and balance of power; Baroque and classic styles.

15, 115. REVOLUTIONARY EUROPE: NATIONALISM, SOCIALISM, IMPERIALISM, 1789-1890

The French Revolution and Napoleon; Conservative reaction; and liberal nationalism; 1848 revolutions; the Industrial Revolution, socialism and colonialism.

16, 116. DEMOCRACY AND TOTALITARIANISM, TWENTIETH CENTURY EUROPE

The origins of World War I; the democratic triumph and the post war years; the Russian Revolution; Italian and German Fascism; World War II; contemporary Europe.

41. HISTORY OF SCIENCE AND TECHNOLOGY

The evolution of science and technology from ancient to modern times. Methods of scientific inquiry; scientific revolutions; function of science and technology in society and their impact upon man and civilizations. The basic purpose of this course is to bridge the gulf between the Humanities and Sciences by demonstrating the underlying conceptual unity of the scientific and non-scientific intellectual experiences.

46. SELECTED REVOLTS

A comparative study of the causes, successes and failures of selected revolutions and rebellions, emphasizing revolutionary leadership, ideology, and organization.

***51, 52, 53. EAST ASIAN CIVILIZATION**

A history of the civilization of East Asia and South East Asia from its beginnings to the present emphasizing in turn the development of the cultures and institutions of the cultures and institutions of China, Japan and South East Asia.

***55, 56, 57. AFRICAN CIVILIZATION**

An interdisciplinary survey of the history of African Civilization from the beginning to the present, emphasizing the development of African cultural institutions, social and political forces, and the more recent impact of western colonial societies.

61, 62, 63. LATIN AMERICAN CIVILIZATION

The evolution of Latin American culture and civilization from Pre-Columbian to recent times, emphasizing political, economic, and social institutions, and the forces for change and modernization.

71. UNITED STATES, 1607-1789

A comprehensive course, stressing about equally political, economic, social and intellectual aspects of American development to 1789. Attention is given to the different interpretations of American history and to the factors that produce new points of view about the nation's past.

72. UNITED STATES, 1783-1865

An historical survey of the United States from the achievement of independence to the Civil War, emphasizing problems of early nationalism, the growth of a more democratic society, and tension leading to civil war.

73. UNITED STATES, 1865-1917

Reunion and reconstruction, North and South. Industrialization and exploitation. The closing of the frontier. From isolation to empire. Progressivism and reaction. The impact of World War I.

74. UNITED STATES, 1917-PRESENT

The paradoxical twenties. The crash, the depression, and the New Deal. The coming of World War II and the impact of the war on American society. The Cold War at home and abroad. Social protest and modern America.

81. THE MEXICAN AMERICAN

A broad history of the Mexican American in California and the Southwest. Special emphasis on the period since 1848 and on Texas, New Mexico, and California.

82. THE BLACK AMERICAN

A history of Black Americans from African backgrounds to the end of reconstruction. Students will examine and discuss basic elements in Black history.

91.77, 92.77. HONORS COLLOQUIUM, EUROPE

Selected problems in Ancient and Modern European history. The methods of the historian (Restricted to Honors Program students).

97.77. HONORS COLLOQUIUM, UNITED STATES

Selected problems in United States history. The methods of the historian. (Restricted to Honors Programs students).

98. LOWER DIVISION SEMINAR

An opportunity for both major and non-major lower division students to explore history in a small group discussion class. Specific subject will vary with different professors.

98.01 Antiquity
98.02 Africa
98.03 Asia
98.04 Europe
98.05 Latin America
98.06 United States

100. THE THEORY AND PRACTICE OF HISTORY

Practical and theoretical problems of the historian. A critical study of historical writing in a specific area of history. Research and composition are emphasized.

108. SOCIETY AND THE SEXES IN WESTERN CIVILIZATION

A survey of the social relationship between the sexes, including male attitudes toward women in western thought, feminism, the daily lives of women in pre-industrial and industrial society, and the nineteenth century women's movements.

118. ANCIENT GREECE

The Mycenaean world; the origins of Hellenic civilization; Periclean Athens; Sparta; interpolis conflicts; Hellenic culture.

120. ANCIENT ROME

The formation of the Roman Republic and its expansion; political and social reform movements; Augustus and the Principate; the culture of the Golden and Silver Ages; Roman law; the decline of the universal state.

121, 122. EARLY MIDDLE AGES, HIGH MIDDLE AGES

An intensive investigation of medieval society, institutions, thought and culture from the collapse of Rome to the Renaissance. Topics include: the formation of a specifically European society in the Early Middle Ages; the deep ambivalences which marked the political, social, and religious institutions of the High Middle Ages.

123. TOPICS IN EARLY MODERN EUROPE

A course treating some specific aspect of European history from the fourteenth through the eighteenth centuries. Topics might include: The Italian

Renaissance, The Diplomacy of the Old Regime, Calvinism, the Counter Reformation and Revolution.

124. SPAIN

Medieval origins of the Spanish kingdoms and the development of Spanish society. The age of discovery and the Siglo de Oro. European power and overseas empire. Crises of the nineteenth and twentieth centuries.

125, 126. HISTORY OF FRANCE

A historical study of the development of French society institutions, thought and culture from the mid-fifteenth century to the 20th century. The Ancien Regime. The French Revolution and the Napoleonic period. The struggle between the monarchical and the republican traditions.

128, 129. GERMANY

A history of the social, economic, political, and cultural development of the German nation. 128, Germany from 1640 to 1890; 129, Germany from 1890 to the present.

130. HISTORY OF IRELAND

A study of Irish history since the Reformation emphasizing the conflict between the Protestant Ascendancy and the Catholic population. The successive struggles for home rule and an independent republic. The modern division of Ireland.

131, 132. ENGLAND

The growth of the English state and constitution. The continental ambitions of England during the Middle Ages. The Tudors and the English reformation. The constitutional struggle under the Stuart monarchs. The development of the modern state. The Industrial Revolution and the emergence of mass man.

136, 137. HISTORY OF RUSSIA

The political, social and religious formation of early Russia; the reforms of Peter the Great; Russian absolutism and the impact of Western Europe in the eighteenth and nineteenth centuries; the Russian Revolution and economic and political developments in the Soviet Union; World War II; the Soviet Union as a world power.

144. EUROPEAN DIPLOMATIC HISTORY

A study of the relations of the major European powers since 1870, with emphasis on the economic, political and social forces which influenced these relations.

151. ORIGINS AND DEVELOPMENT OF ISLAM

The Prophethood of Muhammed and the Muslim Revolution. The Islamic conquests and formation of Muslim Institutions. The development of philoso-

phy, law and art during the "golden age" of Islam. The fragmentation of the Muslim empire; the rise of Turkish power; the Crusades.

152. MODERN MIDDLE EAST AND NORTH AFRICA
European Imperialism and the development of Arab Nationalism. Problems of economic development, political stability and military conflict.

155. MODERN AFRICAN NATIONALISM
Topics in modern African history dealing with African institutions and culture, the challenge of European imperialism, modern African social and political problems.

156. MODERN JAPAN: NATIONALISM AND IMPERIALISM
Demise of the Tokugawas. Meiji restoration and enlightenment. The liberal movement. Socio-economic transformations. Continental expansion. The democratic experiment. Meiji-Taisho social movements. Special reference to ultranationalistic movements. The "Greater East Asia War." Post-war recovery.

157. MODERN MAINLAND SOUTHEAST ASIAN HISTORY
A study of political developments from mid-nineteenth century Anglo-French Imperialism to the emergence of national states. Particular reference to indigenous nationalist movements in French colonial areas and the modern transition in Thailand.

158. MODERN CHINA: FROM CONFUSIUS TO COMMUNISM
Sociopolitical changes from the late Ch'ing Reform Movement. Special emphasis on modern revolutionary movements, political history of the Kuomintang period, and the rise of the Chinese Communist Party.

159. RELIGION AND SOCIETY IN TRADITIONAL ASIA
Great religious traditions of Asia: a historical survey, Introduction to Brahminism, Theravada Buddhism, Mahayana Buddhism, Confucianism, Taoism and Shintoism and their place in Asian social history.

162. COLONIAL MEXICO
A history of Mexico from the Mayas and Aztecs to the end of the independence movement in the 19th century. Includes study of the economic, social and cultural developments.

163. MODERN MEXICO
A history of the national period from the 1824 federal republic to the present. Special emphasis on those factors in the more recent past which have contributed most to modern Mexico.

164. THE INTER-AMERICAN COMMUNITY
A history of the political, economic and social relations between the countries of the two Americas and their activities in regional and world organization.

165. ARGENTINA
Political, social and economic developments in this leading country of South America from pre-Columbian times to the present, with special emphasis on its modern national development.

167. BRAZIL
An analytical study of Brazil's past and present: the colonial era, the New World monarchies of Pedro I and II, and the Republic. Emphasis on social and economic developments.

169. CONTEMPORARY LATIN AMERICA
A topical study of twentieth century political, economic and social life. The dynamics of traditional legacies and reform programs. Ideals and realities of inter-American relations. Cultural characteristics. Present trends and prospects.

170. THEMES IN COLONIAL AMERICA
The development of religious, political, economic and social institutions in the North American colonies in the seventeenth and eighteenth centuries.

171. REVOLUTION, CONFEDERATION, CONSTITUTION
An intensive study of the origins, progress, and culmination of the American Revolution. Historiographical themes of the Revolution will be emphasized.

172. THE REPUBLICAN EXPERIMENT
A detailed examination into the establishment of an American political, social, cultural and economic identity from Washington through Madison.

173. GROWTH OF DEMOCRATIC SOCIETY
An investigation into the tensions leading to civil war and the underlying problems and experiences of the elusive "people" who contributed to the growing complexity of American life.

174. THE OLD SOUTH
An intensive study of the Old South from the Revolution to the Civil War and Reconstruction, emphasizing both regional identity and the relationship of Southern history to the national experience.

177. DIPLOMATIC HISTORY OF THE UNITED STATES
Critical study of the international relations of the United States, and of the economic, political, social and public opinion forces influencing the development of American policy.

178. UNITED STATES INTELLECTUAL HISTORY
A topical study of the patterns of American thought, emphasizing the pursuit of meaningful community life as a major theme in the history of the American mind and imagination.

181. THE RISE OF THE CITY
An historical study of the growth and development of the American city and its impact on all aspects of American life.

183. SOCIAL MOVEMENTS IN TWENTIETH CENTURY AMERICA
Popular movements for change, and against it. An investigation of the response of the American people to the problems of modern industrial society. Labor, women's rights, Black activism, anti-radicalism, Ku Klux Klan, peace movement, and others.

184. WOMAN IN AMERICA
An historical survey of woman's life and work from colonial times to the present in a broad social context.

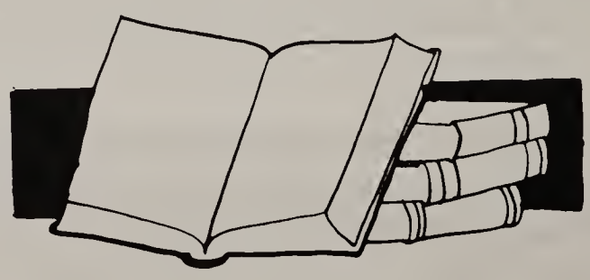
189. CALIFORNIA
The history of California, with major attention given to the period following its annexation to the United States.

190. HISTORIOGRAPHY
A critical and historical study of the writings of great historians from antiquity to the present, relating them to the philosophical currents and social realities of their times; problems in contemporary historiography.

198. COLLOQUIUM
Historical Seminars emphasizing original research and group discussion of selected problems and periods.

198.01 Antiquity
198.02 Africa
198.03 Asia
198.04 Europe
198.05 Latin America
198.06 United States
198.07 Practicum

199. INDIVIDUAL STUDY
Directed reading and research in source materials and secondary works dealing with selected historical problems. With permission of the instructor only.



COLLEGE OF HUMANITIES
DEPARTMENT OF MODERN LANGUAGES AND LITERATURES

Andrew I. Rematore, Ph.D., *Chairman*

Professor: Victor B. Vari
Associate Professors: Raymond L. Biondi, Andrew I. Rematore, K-G Seely, Christian van den Berghe, Maurice M. Belval, S.J., Francisco Jimenez
Assistant Professor: Heribert Breidenbach
Lecturers: Verónica González-Mena LoCoco, Stephen Olivo, S.J.

The degree Bachelor of Arts may be taken in French, German, Italian and Spanish. In addition to such lower division courses as the individual candidate may need, each major must complete a minimum of eight upper division courses in the language of specialization. Each major program requires completion of language 100 and 101 or the equivalent as prerequisite to more advanced work. Only courses in which the student receives a grade of C or higher may be counted toward fulfilling a major requirement. All major programs must be approved by the student's faculty advisor.

High School Credit and Placement

The Department of Modern Languages recommends the following formula for students who wish to continue a language studied in high school. Those who have had two years of a language should enter Language 2; those with four years of a language should enter Language 22; those with three years of a language should consult the language faculty to consider options. Students whose language background is inadequate to permit following the above formula may be permitted to enter lower numbered courses for credit after consultation with a member of the language faculty.

Students having the necessary proficiency, as demonstrated by interview with a member of the language faculty, may enroll in higher numbered courses than those of the placement formula. Once proficiency is established, lower division students may enroll in one upper division course per quarter with the permission of the instructor. Such courses will be counted as fulfilling major requirements.

Courses Exempt from Challenge

Courses numbered 1 through 101 are exempt from challenge.

Language Laboratory

Throughout lower division courses, and in such upper division work as the instructor may specify, students will be required to use the facilities of the language laboratory for approximately 30 minutes per day to increase their language skills. Laboratory work is scheduled individually, and is in addition to the required hours of classroom work.

Conversation Groups

As an adjunct to intermediate and advanced courses, the department offers students the opportunity to participate in small conversation groups of five or six students, under the direction of a native speaker or an advanced major. Those interested in such activities should consult individual language teachers for further details.

French

(See general statement, page 83)

Bachelor of Arts in French

The major program consists of a minimum of eight courses of upper division work in French, including French 185 (Applied Linguistics) or its equivalent, as approved by the student's major advisor. Recommended electives include courses in French or European history, comparative literature, art history, philosophy of language, and additional work in linguistics.

1. ELEMENTARY FRENCH I
Development of skills in understanding, speaking, reading and writing French. Laboratory attendance required.

2. ELEMENTARY FRENCH II
Continuation of French 1.

3. ELEMENTARY FRENCH III
Completion of elementary French.

21. INTERMEDIATE FRENCH I
Review of spoken and written French, with accelerated readings. Prerequisite: French 3 or equivalent.

22. INTERMEDIATE FRENCH II
Continuation of French 21.

50. FRENCH CONVERSATION
Permission of instructor is required in advance of registration.

100. ADVANCED FRENCH I
Intensive speaking and composition. Required of all majors.

101. ADVANCED FRENCH II
Introduction to literary analysis. Required of all majors.

110. CULTURE ET CIVILISATION I
Vie intellectuelle et culturelle des pays de langue francaise.

111. CULTURE ET CIVILISATION II
A continuation of French 110, but may be taken independently.

120. MOYEN AGE
Epic literature, lyric poetry and theatre.

130. SIXTEENTH CENTURY
La Renaissance: Readings in Rabelais, the Pleiade poets and Montaigne.

140. SEVENTEENTH CENTURY
Le Grand Siècle: Evolution of literary and philosophical currents with emphasis on Corneille, Racine, Molière, La Fontaine, Descartes, Pascal, etc.

150. EIGHTEENTH CENTURY
Le Siècle des lumières: Studies in the literature and thought of the Age of Enlightenment with emphasis on Voltaire, Diderot and Rousseau.

160. NINETEENTH CENTURY I
Romantic literature: prose and poetry. (Chateaubriand, Lamartine, Hugo, Vigny, etc.)

161. NINETEENTH CENTURY II
Realist, Naturalist and Symbolist literature. (Stendhal, Balzac, Baudelaire, Flaubert, Zolá, Mallarmé, etc.)

170. TWENTIETH CENTURY I
The writings of *"la belle époque"* and *"entre deux guerres"*. (Proust, Gide, Apollinaire, Malraux, etc.)

171. TWENTIETH CENTURY II
The "engagé" literature, the Anti-theatre and the New Novel. (Anouilh, Sartre, Camus, Ionesco, Robbe-Grillet, etc.)

172. CINEMA
Origins and development of French film—with screenings, analysis and *travaux pratiques.*

180. SEMINARS
Variable topics in the language and literature. May be retaken for credit.

185. FRENCH APPLIED LINGUISTICS
Aspects of Modern French linguistics with special emphasis on phonology and phonetics. Required of all majors.

190. DIRECTED READING
Individually designed programs of advanced readings. Written permission of the instructor and the department chairman required in advance of registration.

German

(See general statement, page 83)

Bachelor of Arts in German

The major program includes a minimum of eight upper division courses in German. Recommended elective courses include English 101 (Introduction to Linguistics), English 102 (Modern Grammar), and History 128 or 129 (Germany).

1. ELEMENTARY GERMAN I
Development of skills in understanding, speaking, reading and writing modern German. Daily work in language laboratory required.

2. ELEMENTARY GERMAN II
A continuation of 1.

3. ELEMENTARY GERMAN III
Completion of elementary German.

5. GERMAN FOR READING
An alternate to German 3. Reading of scholarly articles partially in the student's particular field of study. Prerequisite: German 2.

21. INTERMEDIATE GERMAN I
Systematic review of German grammar, short stories, progressive exercises in conversation.

22. INTERMEDIATE GERMAN II
A continuation of 21. Accelerated readings, conversation and writing

100. ADVANCED GERMAN I
Advanced reading, composition and conversation. Required of all German majors.

101. ADVANCED GERMAN II
A continuation of 100. Required of all majors. Completion or equivalent knowledge will admit students to courses in German Literature.

110. GERMAN CIVILIZATION I
A cultural history of the German speaking countries from the beginning to 1650.

111. GERMAN CIVILIZATION II
A cultural history of the German speaking countries from 1650 to the present.

130. THE CLASSICAL AGE

140. NINETEENTH CENTURY LITERATURE I: 1800-1830

141. NINETEENTH CENTURY LITERATURE II: 1830-1900

150. TWENTIETH CENTURY GERMAN LITERATURE

151. MODERN DRAMA

160. THE GERMAN NOVELLE

161. SURVEY OF GERMAN LYRIC POETRY

170. GERMAN APPLIED LINGUISTICS
Contrastive analysis of German and English with equal emphasis on phonology, morphology, and syntax. Introductory survey of several major schools of linguistics.

190. DIRECTED READING
Individually designed programs of advanced readings. Written permission of the instructor and the department chairman required in advance of registration.

Literature in Translation

N.B. Courses in literature in translation cannot be used as credit toward a German major, teaching credential, or a foreign language requirement.

115. GERMAN LITERATURE IN ENGLISH TRANSLATION

Italian

(See general statement, page 83)

Bachelor of Arts in Italian

The major program includes a minimum of eight upper division courses in Italian. English 65 (Mythology), English 144, 145 (Comparative Literature) and Renaissance History are recommended.

1. ELEMENTARY ITALIAN I
Development of skills in understanding, speaking, reading, and writing modern Italian. Daily work in language laboratory required.

2. ELEMENTARY ITALIAN II
A continuation of 1.

21. INTERMEDIATE ITALIAN I
Review of fundamentals of spoken and written Italian. Progressive readings reflecting Italian culture and values. Progressive exercises in conversation and composition. Prerequisite: 2 or equivalent.

22. INTERMEDIATE ITALIAN II
A continuation of 21.

100. ADVANCED ITALIAN I
Composition, reading and conversation. Required of all majors.

101. ADVANCED ITALIAN II
Composition, reading and conversation. A continuation of Italian 100. Required of all majors.

110. ITALIA ANTICA E MODERNA
Aspetti fondamentali della storia, dell'arte e della cultura dalle origini ai nostri giorni.

120. SURVEY OF ITALIAN LITERATURE I
From its origin to the "settecento."

121. SURVEY OF ITALIAN LITERATURE II
From the "ottocento" to the present.

130. DANTE, LA DIVINA COMMEDIA I
Inferno and Purgatorio.

131. DANTE, LA DIVINA COMMEDIA II
Purgatorio and Paradiso.

140. DUECENTO, TRECENTO
Emphasis on Dante's minor works. Petrarch's poetry, and Boccaccio's Decameron.

150. QUATTROCENTO, CINQUECENTO (RINASCIMENTO)
Important trends in the literary masterpieces of the Renaissance—significant works of Ariosto, Tasso, Leonardo, Machiavelli, Lorenzo de Medici, Poliziano, Castiglione.

160. SETTECENTO
The salient works of Vico, Goldoni, Parini, and Alfieri.

170. OTTOCENTO — I PROMESSI SPOSI
The works of Foscolo, Leopardi, Manzoni's poetry, Carducci, Pascoli and Verga will also be discussed.

180. NOVECENTO
Italian Literature of Twentieth Century with main trends in poetry, drama and the novel, from Pirandello to the present.

190. DIRECTED READING
Individually designed programs of advanced readings. Written permission of the instructor and the department chairman required in advance of registration.

Japanese

(See general statement, page 83)

1. ELEMENTARY JAPANESE I
Development of skills in understanding, speaking, reading and writing modern Japanese. Daily work in language laboratory required.

2. ELEMENTARY JAPANESE II
A continuation of 1.

3. ELEMENTARY JAPANESE III
A continuation of 2.

4. ELEMENTARY JAPANESE IV
Completion of elementary Japanese.

Spanish

(See general statement, page 83)

Bachelor of Arts in Spanish

The major program consists of a minimum of eight upper division courses in Spanish, including Spanish 175 (Applied Linguistics). Majors may choose to concentrate in Latin American material, Spanish peninsular material, or may combine the two fields, but all major programs must be approved by the student's faculty advisor. The humanities core curriculum sequence in Latin American Civilization (History 61, 62, 63) is strongly recommended, as are courses in the history of Latin America and Spain. Spanish 175 and 176 are required of all students preparing to teach Spanish or in bilingual-cross cultural programs at any level.

1. ELEMENTARY SPANISH I
Development of skills in understanding, speaking, reading and writing modern Spanish, in that order. Daily work in language laboratory required.

2. ELEMENTARY SPANISH II
A continuation of 1.

3. ELEMENTARY SPANISH III
Completion of elementary Spanish.

21. INTERMEDIATE SPANISH I
Review of fundamentals of spoken and written Spanish. Progressive readings reflecting Hispanic culture and values. Progressive exercises in conversation and composition. Prerequisite: 3 or equivalent.

22. INTERMEDIATE SPANISH II
A continuation of 21.

50. SPANISH CONVERSATION
Intensive work stressing the single skill of Spanish conversation in everyday situations. Practice conducted primarily in small groups. Prerequisite: Spanish 22 or equivalent, and permission of the instructor.

100. ADVANCED SPANISH I
Composition, conversation and grammar. Introduction to literary analysis. Required of all majors. Prerequisite: 22.

101. ADVANCED SPANISH II
A continuation of 100. Required of all majors.

N.B. Completion of 100, 101 or evidence of equivalent preparation will admit students to higher-numbered courses.

105. SPANISH PRONUNCIATION AND INTONATION
Systematic study of the pronunciation and intonation of modern Spanish. Intended for majors, minors and prospective teachers needing further perfection of these skills. Individual diagnoses. Daily laboratory recording exercises. Prerequisite: 22 or equivalent.

120. MAJOR WORKS OF SPANISH LITERATURE I
Readings in Spanish literature from the beginnings to the end of the seventeenth century. Alternate years.

121. MAJOR WORKS OF SPANISH LITERATURE II
Readings in Spanish literature of the eighteenth and nineteenth centuries. A continuation of Spanish 120, but may be taken separately. Alternate years.

125. COLLOQUIUM: SPANISH LITERATURE
Topic will vary. Reading and discussion of selected themes in Spanish Peninsular literature. Prerequisite: course work in Spanish Peninsular literature or permission of instructor. May be retaken for credit.

130. SURVEY OF LATIN-AMERICAN LITERATURE I
Readings in Latin-American literature from the Colonial period to about 1888.

131. SURVEY OF LATIN-AMERICAN LITERATURE II
Readings in Latin-American literature from the Modernista movement to the present.

135. COLLOQUIUM: LATIN-AMERICAN LITERATURE
Topic will vary. Reading and discussion of selected themes in Latin American literature. Prerequisite: course work in Latin American literature or permission of instructor. May be retaken for credit.

140. MODERN LATIN-AMERICAN LITERATURE I
Study of major Latin American writers of the late nineteenth and early twentieth centuries with emphasis on the novel. Given in alternate years.

141. MODERN LATIN AMERICAN LITERATURE II
A continuation of 140, but may be taken separately. Given in alternate years. To be offered in 1977-78.

145. CONTEMPORARY LATIN AMERICAN LITERATURE I
Study of major Latin American writers of the mid-twentieth century. Given in alternate years.

146. CONTEMPORARY LATIN AMERICAN LITERATURE II
A continuation of 145, but may be taken separately. Given in alternate years. To be offered in 1977-78.

150. TWENTIETH CENTURY SPANISH LITERATURE I
A study of the major writers of Spain from 1898 to 1936, with particular emphasis on the Generation of 1898.

151. TWENTIETH CENTURY SPANISH LITERATURE II
A study of the major writers of Spain from 1936 to the present.

165. CERVANTES: DON QUIJOTE

175. SPANISH APPLIED LINGUISTICS I
Introduction to the study of applied linguistics. Detailed scientific analysis of the phonology of modern Spanish. Contrastive analysis of Spanish and English sound systems. Required of all Spanish majors, and of all prospective teachers of Spanish and/or bilingual-cross cultural education.

176. SPANISH APPLIED LINGUISTICS II

Detailed scientific analysis of the morphology and syntax of modern Spanish. Contrastive analysis within the Spanish structure system, and between Spanish and English structure systems. Prerequisite: 175. Required of all prospective teachers of Spanish and/or bilingual-cross cultural education.

190. DIRECTED READINGS IN SPANISH

Individually designed programs of advanced readings. Written permission of the instructor and the department chairman required in advance of registration.

Literature in Translation

N.B. Courses in literature in translation cannot be used as credit toward a Spanish major, teaching credential or a foreign language requirement.

115. TWENTIETH CENTURY MEXICAN LITERATURE IN TRANSLATION

Reading, analysis and discussion of outstanding works by modern and contemporary Mexican writers. Emphasis on the novel.

117. LATIN AMERICAN LITERATURE IN TRANSLATION

Reading, analysis and discussion of works of leading Latin American writers, with emphasis on contemporary novelists of South America.

195. DIRECTED READINGS IN LATIN AMERICAN LITERATURE IN TRANSLATION

Individually designed programs of readings. Written permission of the instructor and the department chairman required in advance of registration.

COLLEGE OF HUMANITIES
DEPARTMENT OF MUSIC

Roger Nyquist, D.Mus., *Chairman*

Associate Professors: Roger Nyquist, Lynn Shurtleff
Assistant Professor: Robert Hagopian
Acting Assistant Professor: James Bert Neely
Adjunct Lecturer: Neal LaMonaco
Artist-in-Residence: Charles Lampkin

The Music Department offers a major program, leading to the B.A. degree, with specializations in Applied Music, Music History and Literature, Theory, Composition, and Choral Conducting. Instruction is designed to prepare students for careers in the fields of concert, opera, orchestra, and teaching. There are special curricula for the composer and for the preparation of private teachers, church organists, and choirmasters. Scholarship, research, and preparation for graduate studies are encouraged.

The Department also offers general courses of interest and cultural value to all university students who wish to become either trained performers or simply appreciative listeners.

A student majoring in Music, in addition to completing the University and College requirements, must earn a minimum of 63 quarter units of credit in the Department. Of these 63 units, at least 35 must be earned in upper division courses taken in the final two years. Applied Music majors must perform a 45 minute recital in junior year and a 75 minute recital in senior year. Music History, Theory, and Composition majors must write a thesis or composition during senior year. The Department is a member of the National Association of Schools of Music.

Applied Music

Private instruction is available in applied music 1 through 16 lower division, and 100 through 116 upper division. One unit credit is given for lower division and two unit credits for upper division each quarter. (Extra fee for all private instruction 1 through 15 and 100 through 115.)

1/100. ORGAN

2/102. HARPSICHORD

3/103. PIANO

4/104. VOICE

5/105. VIOLIN

6/106. VIOLA

7/107. VIOLONCELLO

8/108. DOUBLE BASS

9/109. WOODWINDS

10/110. BRASS

11/111. PERCUSSION

12/112. PERCUSSION ENSEMBLE

13/113. PIANO CLASS

14/114. CONDUCTING

15/115. COMPOSITION

16/116. DIRECTED STUDY IN THEORY

117. JUNIOR RECITAL
(Forty-Five minute Recital.)

118. SENIOR RECITAL
(Seventy-Five minute Recital.)

119. SENIOR THESIS
For Theory, History and Composition majors. A comprehensive paper or composition approved by the faculty.

Ensemble

70/170. INSTRUMENTAL ENSEMBLE

71/171. UNIVERSITY CONCERT CHOIR—By Audition only.
Open to selected students for preparation and performance in concert of works of the significant choral literature. One unit credit given for each quarter.

72/172. UNIVERSITY CHAMBER SINGERS—By Audition only.
A select group of singers for performance of unaccompanied polyphonic music. Some performances in conjunction with Mission Church services. Limited outside performances. One unit credit given for each quarter.

73/173. UNIVERSITY ORCHESTRA—By Audition only.
Open to selected students for preparation and performance in concert of works of the significant orchestral literature. One unit credit given for each quarter.

Special Voice Classes

74/174. VOICE CLASS
Application of basic vocal techniques to develop singing facility. Designed for those interested in the dramatic stage. Open to all except voice majors.

75/175. LYRIC DICTION
Drills and class performance, based on International Phonetic Alphabet, of songs in various languages. First quarter: English and Italian. Second quarter: German and French.

76/176. OPERA WORKSHOP
Preparation, rehearsal, and performance of scenes and complete works drawn from the musico-dramatic repertory. For singers and technicians. By permission only. 2 Unit credit for each quarter.

77/177. THE SONG CYCLE
Intensive study of representative song cycles from Beethoven to the present. For singers and pianists.

Music History and Literature

20. INTRODUCTION TO MUSIC
How to listen to music; art of music and its materials; instruments and musical forms; music of the 17th through 20th centuries. Open to non-majors. Prerequisite to all classes in the Department of Music.

21. MUSIC OF ANTIQUITY THROUGH THE RENAISSANCE
A history of western music from its beginning through the 16th century.

22. MUSIC OF THE BAROQUE ERA
A history of the important musical developments from 1600 to 1750.

23. MUSIC OF THE ROCOCO AND CLASSIC ERAS
A history of the important musical developments from 1725 to 1830.

24. MUSIC OF THE ROMANTIC ERA
A history of the important musical developments from 1800 to 1900.

25. MUSIC OF THE 20TH CENTURY
A history of the important musical developments from 1900 to the present.

127. ORGAN LITERATURE
A survey of the important organ literature from 1500 to the present.

128. PIANO LITERATURE
A survey of the important vocal literature from 1700 to the present.

129. VOCAL LITERATURE
A survey of the important vocal literature from 1600 to the present.

30/130. CHORAL LITERATURE
Sacred and secular music from 16th century to the present. 1. Smaller forms: motets, anthems. 2. Larger forms: oratorios, cantatas.

31/131. HISTORY OF OPERA
A study of the development of the musical dramatic stage from 1600 to the present, including the indigenous American forms.

32/132. THE SYMPHONY
The development of symphonic music. Detailed analysis of representative works for the symphony orchestra and supplemental readings. Open to non-majors.

33/133. CHAMBER MUSIC
A study of music for chamber ensembles, beginning with the early 17th century. Analysis of typical works in various media from different periods, with emphasis upon 18th and 19th centuries. Open to non-majors.

134. PERFORMANCE PRACTICE PROBLEMS SINCE 1600
Styles of solo and ensemble performance of instrumental and vocal music from Baroque to the present. Changing aspects of medium, tempo, dynamics, phrasing, ornamentation, improvisation, temperament, etc.

135. MUSIC CRITICISM
Problems, principles, and procedures of descriptive and critical analysis and synthesis; relationship of language to description and criticism.

36. ETHNIC MUSIC
A survey of the origins, growth and development of Folk music of the United States from the Colonies to the present. Non-majors.

37. HISTORY OF JAZZ I
A survey of the origins, growth and development of Jazz; its sociological importance and influence on composers of serious music. Non-majors.

38. HISTORY OF JAZZ II
Continuation of Jazz I. Non-majors.

39/139. J. S. BACH
Life and works of Bach, with special emphasis on development of his musical style; detailed study of a selection of his chief works. Open to non-majors.

40/140. BEETHOVEN
Life and works of Beethoven, with emphasis on development of his musical style. Analysis of representative works. Open to non-majors.

41/141. BARTOK
Life and works of Bartok, with emphasis on development of his musical style. Open to non-majors.

42/142. STRAVINSKY
Stravinsky as a central figure of 20th century music; his musical styles and their sources. Open to non-majors.

143. MUSIC SEMINAR
An exploration of the relationship of various philosophies of music with the actual writings of influential music critics over the centuries.

Theory and Composition

50. BASIC MUSICIANSHIP
For students who fail to qualify for Theory I. Listening techniques and basic principles of music. A student who fails this course may not major in music. Open to non-majors.

51. THEORY I
Basic terminologies and problems of notation, melody, rhythm, harmony and their relationship to musical form. Lecture and drill in writing melodies, sight reading, ear training and analysis. Primary triadic harmonies. Lab required.

52. THEORY II
Continuation of Theory I. Secondary triadic harmonies; lecture and drill in sight singing, ear training, keyboard harmony, analysis and composition. Lab.

53. THEORY III
Modulation and chromatic harmony. Lecture and drill in sight singing, ear training, keyboard harmony, analysis and composition. Lab required.

54. THEORY IV
Analysis of 20th century techniques; a study of serialism and its development.

155. ADVANCED KEYBOARD HARMONY AND MUSIC READING SKILLS
Intensive training in keyboard facility and sight singing. Application of material introduced in 28.051, 52, 53.

156. MODAL COUNTERPOINT
16th century. Analysis of contrapuntal procedures and representative compositions; writing of motets and masses. Emphasis on style of Palestrina.

157. TONAL COUNTERPOINT
18th century. Analysis of contrapuntal procedures and compositions; writing of inventions, chorale preludes, canons, and fugues. Emphasis on style of J. S. Bach.

158. ORCHESTRATION
Prerequisite: 28.051, 52, 53. Ranges, tonal possibilities, technical limitations, and necessary transpositions for all orchestral instruments.

159. ADVANCED ORCHESTRATION
Required for Theory and Composition majors. Practical orchestration in all its applications.

160. FORM AND ANALYSIS
Analysis of representative works of 18th century. Baroque and Classic.

161. FORM AND ANALYSIS
Analysis of representative works of 19th and 20th centuries.

162. COMPOSITION
Organization of musical ideas into logical and homogeneous form, with emphasis on traditional forms. Prerequisite: 28.051, 52, 53, 600.

Techniques and Conducting

65/165. CONDUCTING
Baton techniques, fundamentals of score reading, rehearsal techniques, choral and instrumental tone, interpretation of music. Use of full orchestral score. Preparation and performance of major works.

66/166. VOCAL PEDAGOGY
Studies in vocal production: respiration, phonation, articulation, resonation. Supervised student teaching.

167. DIRECTED STUDY
Personal research in an area of music history, aesthetics or applied music not covered in the course offerings. By Permission of Chairman only.

COLLEGE OF HUMANITIES
DEPARTMENT OF PHILOSOPHY

James W. Felt, S.J., Ph.D., *Chairman*

Associate Professors: James W. Felt, S.J., William A. Parent
Assistant Professors: Timothy P. Fallon, S.J., James G. Fisher, Jr., James W. Friedman, Manuel Velasquez, S.J.
Acting Assistant Professors: Daniel O. Dahlstrom, Christopher A. Page
Adjunct Lecturer: Carol J. White
Visiting Distinguished Professor: Frederick C. Copleston, S.J.

The University offers both a four-year undergraduate program leading to the Bachelor of Arts degree with philosophy as the major field, and also a wide variety of philosophy courses of interest and value to all students, regardless of their major. The courses are divided into three levels presupposing increasing degrees of philosophical background.

Students majoring in other fields who wish to explore the general methods and problems of philosophy are recommended to take Introduction to Philosophy (4), or Values & Conduct (5), or, for a fuller experience, the historical sequence, Ancient & Medieval Philosophy (1), Early Modern Philosophy (2), and Modern & Contemporary Philosophy (21). A number of more specialized courses are also offered on the Introductory Level (from Logic, 25, on) for students with particular interests.

The Major in Philosophy

Students wishing to make philosophy their major subject combine a solid undergraduate philosophical education in philosophy with considerable flexibility of program. Besides fulfilling the general requirements of the University and of the College of Humanities, students majoring in philosophy must take twelve courses in philosophy, of which at least eight must be upper division courses taken in the junior and senior years; four are normally lower division courses. More specifically:

On the Introductory Level required courses are 1, 2, 21, and 25 (or their equivalents). Philosophy majors must complete 1 and 2 before enrolling in any upper division philosophy courses. On the Intermediate Level philosophy majors must take at least two courses in either of the following historical periods: ancient and medieval philosophy (for example, 112, 113, or 115); philosophy of the 17th and 18th centuries (for example, 118 and 120).

Strongly recommended for inclusion in each major's program are courses involving the three traditional areas of philosophy: metaphysics, epistemology, and ethical theory. Also strongly recommended are Philosophical Writing (101) at the beginning of junior year, and Senior Thesis (198) during the winter term of senior year.

A passing (C) average must be maintained in all philosophy courses taken together.

Each student majoring in philosophy will be assigned an Academic Advisor from among the Department's staff; the student is free to change Advisors after becoming

better acquainted with the faculty. The Advisor must be consulted each term so as to insure coherence of the program as well as adaptation to the student's own interests.

Introductory Level

a) General Introductions:

*** 1. ANCIENT & MEDIEVAL PHILOSOPHY**
The beginnings of Western philosophy studied in representative writers of the Greek and medieval traditions, with attention to their historical and literary milieu and to their relevance to contemporary thought.

***2. EARLY MODERN PHILOSOPHY**
Study of the principal fashioners of the modern mind: philosophers mainly of the seventeenth and eighteenth centuries, studied in the historical and literary context of their times and in their impact on our own.

4. INTRODUCTION TO PHILOSOPHY
An introduction to philosophy through a consideration of the problems raised in at least three major areas: ethics, metaphysics, and epistemology. Recommended as a beginning course in philosophy.

5. VALUES AND CONDUCT
Exploring current ethical questions with special attention to formulating a standard of morality for the personal life, this course examines the concepts of person, love, freedom, value, and responsibility.

***21. MODERN & CONTEMPORARY PHILOSOPHY**
Exploration of the main currents of philosophical thought in the nineteenth and twentieth centuries, particularly German idealism, the analytic tradition, process thought, phenomenology and existentialism, with attention to their relation to historical events and contemporary literature. Prerequisite: 2.

b) Courses for Special Interests:

25. LOGIC
An introduction to the techniques of truth functional, syllogistic, and quantificational logic. Includes discussion of and practical work in detecting logical fallacies.

26. MODERN MAN AND THE STATE
This course introduces the student to political and legal philosophy. It strives for a closer understanding of the human person as he confronts and tries to perfect the political and legal institutions which shape his existence.

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*Courses in the historical sequence of the Core Curriculum of the College of Humanities.

28. FREEDOM AND TIME
Philosophical exploration of whether and in what sense man is free in his decisions, not simply determined by conditioning and environment. This problem will be seen to revolve around man's understanding of the nature of time.

29. PHILOSOPHIC TOPICS IN LITERATURE AND FILM
A study of selected works of literature (and film) in order to investigate a range of philosophic problems. Topics considered will include: the limits of man's rationality, absurdity, human suffering, the nature of reality.

Intermediate Level

(General prerequisite, except where noted: at least one course on Introductory Level)

102. METAPHYSICS
Exploration of the structure of being, with the aid both of historical and of contemporary methods, particularly those utilizing an analysis of the structure of human experience.

105. GOD AND PHILOSOPHY
Philosophical inquiry, based on both classical and contemporary views, as to whether the existence of God can be rationally demonstrated, whether it is compatible with evil, and how man relates to God.

106. ETHICS: THEORY AND PRACTICE
An examination of the possibility and nature of ethical knowledge, with emphasis on the application of philosophical principles to contemporary moral problems.

107. BIOMEDICAL ETHICS
An examination of important moral problems raised by recent advances in biological research and medicine. No philosophy prerequisite.

108. PHILOSOPHY OF LINGUISTICS
A survey of philosophical presuppositions and implications of current trends in linguistics. Prerequisite: one course in either philosophy or linguistics.

109. ADVANCED LOGIC
Continuation of 25. Formal deductive systems; completeness; decidability and undecidability; the theory of descriptions and identity theory; models and integrations; an introduction to the philosophy of logic. Prerequisite: 25.

112. PLATO
Intensive study, through selected *Dialogues,* of the thought of this seminal thinker in Western philosophy; evaluation of his contribution to modern ideas of man and of culture. Prerequisite: 1.

113. ARISTOTLE
Close study of selected writings of the founder of systematic philosophy, science, and logic in the West: toward a modern appropriation of the best of his thought. Prerequisite: 1.

115. MEDIEVAL PHILOSOPHERS
Reading and interpretation of selected texts of medieval philosophers, often with special attention to the writings of St. Thomas Aquinas, disengaging what is relevant to our age.

118. RATIONALISM
Study of the systematic thought of the rationalistic founders of the modern era, principally Descartes, Spinoza, and Leibniz, with reference also to rationalistic trends in our own times.

120. KANT I
A study of Kant's *Critique of Pure Reason*. Prerequisite: 2.

125. MARXISM
A study of Karl Marx's philosophic thought, with particular focus on prominent contemporary reinterpretations.

126. EXISTENTIALISM
A general introduction to Existentialism in its analysis of the basic structures of human existence, particularly freedom, and in its major thinkers. Prerequisite: 2, or permission of the instructor.

133. TECHNOLOGY AND SOCIAL VALUES
A consideration of technology itself (as knowledge, as skill, as means), its products, its requirements, its relation to values, and its actual and (possible) future effects on the human community. No philosophy prerequisite.

134. PHILOSOPHY OF SCIENCE
Exploration of the philosophical presuppositions involved in the methods of modern science, particularly physics; of the structure and development of theories; and of the relation of scientific knowing to other modes of knowing. Prerequisite: two courses in science or mathematics, or one course with laboratory. No philosophy prerequisite.

135. PHILOSOPHY OF SOCIAL SCIENCE
Current topics in the philosophy of the social sciences (e.g., foundations, role of values). No philosophy prerequisite.

136. PHILOSOPHY OF LAW
An intensive study of the nature of law and of the relation between legal and moral obligation. No philosophy prerequisite.

137. MORALITY AND THE LAW
An examination of important moral issues in contemporary law. No philosophy prerequisite.

138. POLITICAL PHILOSOPHY
A critical examination of important political theories and concepts (e.g., liberty, equality, justice, and rights).

145. AESTHETICS
Study of basic philosophical questions concerning art and art criticism, such as those inquiring into the objectivity of aesthetic value.

149. CONTEMPORARY PROBLEMS
Philosophical analysis of selected contemporary problems; readings and discussions. Prerequisites, if any, to be announced.

Advanced Level

(General prerequisite: two courses on Intermediate Level)

150. EPISTEMOLOGY
Systematic formal study of human knowing and its structure.

160. KANT II
Advanced study of selected themes in the thought of Kant, early to late. Prerequisite: 120.

164. HEGEL
A study of Hegel's thought in the context of its historical antecedents and consequences. Prerequisite: 120.

167. EARLY ANALYTIÇ PHILOSOPHY
Investigation of application of techniques of formal logic to philosophic problems by Frege, Russell, and Wittgenstein. Prerequisite: one course in logic.

168. HEIDEGGER
Reading and analysis of the argument in *Being and Time* with an introduction to the later work: toward a critical appreciation of Heidegger's ontology and its influence. Prerequisite: 120 or permission.

172. PHENOMENOLOGY
Comprehensive historical introduction to the phenomenological movement in Husserl and other representative figures together with a detailed introduction to the phenomenological method and its importance in the social sciences. Prerequisite: 120 or 2.

175. PHILOSOPHY OF PSYCHOLOGY
Investigation of the logical structure of psychological concepts.

190. ADVANCED TOPICS IN PHILOSOPHY
Selected philosophical problems studied at an advanced level.

197. SENIOR SEMINAR
Senior philosophy majors select an instructor from the philosophy faculty, and, together, decide upon a text or topic for study. The responsibility for the seminar is shared between the student and faculty participants. By arrangement during previous term.

198. SENIOR THESIS
Creation of a carefully researched and scholarly paper, under the active direction of a selected member of the Department's staff. Offered in the winter term. Of particular value to senior students who intend to pursue graduate studies.

199. DIRECTED STUDY
Tutorial work, with demanding requirements, for advanced students in particular problem areas not otherwise accessible through courses. By previous arrangement only, with the instructor and the Department chairman.

COLLEGE OF HUMANITIES
DEPARTMENT OF RELIGIOUS STUDIES

Joseph A. Grassi, *Chairman*

Professors: Theodore J. Mackin, S.J., Joseph A. Grassi
Associate Professor: Gary J. Quinn
Assistant Professors: Donald F. Crosby, S.J., Vance L. Eckstrom, Francis R. Smith, S.J., James E. Sweeters, Donam H. Wakefield
Acting Assistant Professor: James W. Reites, S.J.
Lecturers: Daniel V. Germann, S.J., Edward D. McShane, S.J., Salvatore A. Tassone, S.J., Tennant C. Wright, S.J.

General Requirements

Students entering the University with less than 44 quarter units are required to complete three courses in religious studies, at least one of which must be completed during one of the two final years. Students entering with more than 43 units but less than 88 must complete two courses, one of these during the final two years. Those entering with more than 87 quarter units must complete one course before graduation.

The Major in Religious Studies

In addition to the requirements in general education for all students in the College of Humanities, the following are specific for students completing the major in Religious Studies:

Philosophy: Two courses. The course in Metaphysics is recommended. (Students taking the three-course core sequence in History of Philosophy fulfill this requirement.)

Foreign Language: By the end of the fall term of senior year the student must complete a reading proficiency test, administered by the Department of Religious Studies, in one classical or modern language.

History: Two courses. These may be either the two-course sequence in the History of Christianity or a two-course sequence in History of Western Civilization. The latter is preferred. (Students taking the three-course core sequence in Western Civilization fulfill this requirement.)

Fine Arts: Two courses selected from among those offered by the departments of Fine Arts, Music and Theatre Arts. (Students taking the three-course core sequence in History of Art fulfill this requirement.)

Requirements in Religious Studies

In consultation with his academic advisor the student is to select four lower division courses that best supplement his earlier instruction and open, as well, into his area of interest in Religious Studies.

Again in consultation with his or her advisor the student is to select eight upper division courses in religious studies which develop an area of concentration; or if no

area of concentration has been chosen, eight upper division courses which complete a coherent program in undergraduate Religious Studies. Among these eight courses is to be included Religious Studies 198: Directed Reading and Research.

1. **INTRODUCTION TO RELIGIOUS STUDIES**
A basic description of the most universal ways man has been religious. Reflections on the contemporary ways of being religious, especially in light of religious pluralism and secularism.

2. **INTRODUCTION TO THE OLD TESTAMENT**
A survey of the history of the people of Israel from the exodus through the post-exilic period to the Christian era, with particular attention on the formation of the Old Testament literature and on the developing form and content of the people's religious belief.

3. **INTRODUCTION TO THE NEW TESTAMENT**
A study of the formation of the New Testament literature in the first generations of the Christian community; in interpretation of the literary forms used by the community; an examination of the form and principal content of the primitive belief and worship.

4. **INTRODUCTION TO CHRISTIAN THEOLOGY**
An introduction to Christian Theology through an examination of the points on which Protestant and Catholic theologians agree and disagree. A first course in ecumenical theology.

5. **INTRODUCTION TO CATHOLIC THEOLOGY**
A course designed for Catholic students who wish to discover the roots of Catholic doctrine in Scripture and Tradition. An historical-critical approach to Scripture is taken.

6. **CHRISTIAN ORIGINS**
A study of the environment in which Christianity began: Judaism in the time of Jesus (Qumran community, Pharisees, Zealots, Sadducees, ordinary people), the Hellenistic and Roman religions. The earthly ministry of Jesus. The transition from Kingdom to Church. The emergence of Christianity from Judaism.

7. **THE PRACTICE OF MEDITATION**
A lower division course which combines the study and practice of various forms of meditation, Eastern and Western.

8. **THE BIBLE AND SOCIAL ETHICS:**
A study of the prophetic tradition of the Old and New Testament with special emphasis on biblical justice and love along with its meaning in today's society.

9. PRACTICE OF CHRISTIAN MEDITATION
A lower division course which combines the study of Christianity with the practice of meditation.

11. DEATH AND RELIGION
This course combines a study of various attitudes to death with methods of self-awareness so that the students may clarify their own attitudes towards death and life.

12/112. GREAT CHRISTIAN MYSTERIES
From a Biblical and historical point of view the central Christian mysteries of Christ, God, the Trinity, Grace, Sin, Redemption, Man and Human Destiny are studied.

13. DEATH AND THE CHRISTIAN RELIGION
After some preparatory studies of pertinent stories, images and attitudes to death in archaic religions, the course illuminates, by comparison and contrast, something of the understanding of death and eternal life as it is presented in the life and teachings of Jesus.

15. INTRODUCTION TO PROTESTANT THOUGHT
Focuses on the most important figures of the Reformation (Luther, Zwingli, Calvin, the radical reformers) and issues (faith, justification, good works, authority, Scripture, the Church, the ministry). Relates these topics to contemporary ecumenical theological discussion.

16/116. THEOLOGY OF SUFFERING
The classic question of how a good God can let innocents suffer is followed in its evolution through the old and new testaments, *Job,* war and the atomic bomb, and world literature. The best approaches and perhaps solutions through the ages culminating in the insights of Teilhard.

20. CHRISTIAN PERSPECTIVES OF MAN
The specific relationship of the teaching of the Bible and Christian tradition on such matters as the origin of mankind, the human condition, the destiny of mankind and its attainment.

21. THE CHRIST OF FAITH
Selective theological interpretations of Jesus Christ, from Biblical literature, the history of Christian doctrine, and modern theological scholarship. The humanity and divinity of Jesus.

30. THE CHRISTIAN COMMUNITY
From a biblical, historical and ecumenical point of view, the origins, role, and future of the Church are examined.

51. EASTERN RELIGIONS

The course is designed to investigate religion as a way of life in the Far East. It is meant for students who know little about the religious cultures of the Far East but who recognize the great impact religion has had on the Eastern peoples.

52. WESTERN RELIGIONS

A study of the religious origins of Western man. Prehistoric and primitive cultures will be briefly considered, but a more detailed investigation will be made into the major religious cultures of the Middle East which have had a profound influence on values in the West.

60. CHRISTIAN ETHICS

A study of the dynamics of Christian conduct and of the moral implications of the Christian commitment. The formulation of the principles of a Christian ethic, their application to selected areas of moral conduct in contemporary life, e.g. to wealth and poverty, violence and non-violence, war and peace, inter-personal relations.

75/175. AMERICAN RELIGIOUS EXPERIENCE: THE COLONIES TO THE CIVIL WAR

A survey of American religious themes, movements and personalities from the colonies to the Civil War. Principal topics: Puritanism, Its Rise and Fall; The Churches and the Revolution; Religious Freedom and Separation of Church and State; Revivalism; Humanitarian Reform; Slavery and the Civil War.

76. AMERICAN RELIGIOUS EXPERIENCE: THE CIVIL WAR TO THE PRESENT

A survey of American religious themes, movements and leading personalities from the Civil War to the present. Principal topics: The Development of Black Churches; The New Immigration, Nativism and the Catholics; The Social Gospel; Churches and Imperialism; The Churches in the twenties and thirties. The Churches and World War II; Post-war Religious Developments.

80. CHRISTIAN LITURGY

The course leads the students into a living appreciation of the structure and rhythm of liturgical worship and of its function as Christian celebration in such matters as the origin of mankind, the human condition, the destiny of mankind and its attainment.

84/184. ORIGINAL SIN IN MODERN LITERATURE

Existentialist writers (Kafka, Camus, etc.) analyse what is wrong with human nature in certain patterns of unspecified guilt and death which repeat the age-old analysis of original sin which we will understand in the post-evolution modern theological approach of Teilhard de Chardin.

90/190. RELIGION, SCIENCE AND TECHNOLOGY
A survey of the controversies between scientists and the Church, from Galileo through Darwin to the present. A focus on scientific method, revelation, and the relation of God to the universe. Also a survey of current moral and social issues rising out of applied technology.

101. OLD TESTAMENT: THE PROPHETS
A study of the Former Prophets and the Latter Prophets according to the Hebrew tradition. An analysis of the meaning of prophet in the religious community, Israel.

102. OLD TESTAMENT: THE WRITINGS
A study of those books making up the Writings of the Hebrew tradition, as well as the added books of the deutero-canonical Wisdom Literature of the Septuagint. Selected readings in the inter-testamental writings and an inquiry into their influence on early Christianity.

106. THE SYNOPTIC GOSPELS
A study of the Synoptic Gospels, of the history of their formation, of their literary forms. An analysis of Salvation History as contained in these sources.

107. THE THEOLOGY OF ST. PAUL
A study of the formation of the New Testament books attributed to Pauline authorship, of their vocabulary, imagery and religious concepts. An analysis of the Pauline theology.

108. THE THEOLOGY OF ST. JOHN
A study of the fourth Gospel, the Johannine letters and the Apocalypse, in reference to their vocabulary, imagery and theological concerns.

14/114. SPIRITUALITY OF THE NEW TESTAMENT
This course will study the origins and development of Christian Spirituality in the New Testament.

117. BIBLICAL GREEK, PART I
A study of the Koine Greek of the New Testament. For majors only.

118. BIBLICAL GREEK, PART II
A continuation of Religious Studies 117. Enrollment reserved for students who have completed that course or its equivalent.

119. BIBLICAL HEBREW I
For Religious Studies Majors only.

120. BIBLICAL HEBREW II
Continuation of Hebrew I.

122. THE PERSON OF CHRIST IN THE NEW TESTAMENT
A systematic study of the origins in Scripture of Christian belief in the person and natures of Jesus, and of his work in redeeming.

29/129. RELIGION AND PERSONAL GROWTH
An application of the basic insights of religion and man's Christian life. The appreciation is developed through the students' creating, as well as critically analyzing, various forms of Christian liturgy.

41/141. RELIGIOUS AUTOBIOGRAPHY
This course will study selected Christian autobiographies from St. Paul to Dag Hammarskjold.

142. CHRISTIAN MYSTICISM
A study of selected writers in the contemplative and mystical traditions of Western mysticism.

144. THE PSYCHOLOGY OF RELIGION
A study of the phenomenon of religion as expressed in the various religious literatures, using both the psychological reflection on religion and the methods of analysis by psychologists, classical and contemporary.

48/148. ZEN BUDDHISM
This course combines a study of Zen Buddhism with the actual practice of Zen meditation and some Zen ritual.

149. THE THEOLOGY OF MARRIAGE
A study of marriage Christianly understood from the Scriptures and from recent Catholic writing, and from a humane psychology of the human person. A survey of Roman Catholic Canon Law on marriage.

166. THE THEOLOGY OF NON-VIOLENCE
An investigation of non-violence not only as an instrument of social change but as a way of life in its character of by-product of the Christian commitment.

168. SEXISM AND RELIGION
An investigation of the role of women in the religious traditions of East and West. A study of the concept of feminine and masculine symbolism in matriarchal and patriarchal social structures utilizing an interdisciplinary methodology.

170. THE HISTORY OF CHRISTIANITY, PART I
A study of the history of the Church from the first community at Jerusalem until the eve of the Protestant reformation. The ruling perspective is that of developing theology and changing religious expression, but these set in their cultural and political contexts.

171. THE HISTORY OF CHRISTIANITY, PART II
A continuation of Religious Studies 170, beginning with the Protestant reformation and continuing until the present. Again the perspective is that of developing theology and changing religious expression.

180. CHRISTIAN LITURGY II

192. SPECIAL QUESTIONS IN RELIGIOUS STUDIES

197. PRACTICUM IN RELIGIOUS STUDIES
A combination of teaching or religious work, special readings, and theological reflection under the guidance of the department faculty. Restricted to majors in Religious Studies.

198. DIRECTED READING AND RESEARCH IN RELIGIOUS STUDIES

COLLEGE OF HUMANITIES
DEPARTMENT OF THEATRE ARTS

William R. James, Ph.D., *Chairman*

Associate Professor: William R. James
Lecturers: Lynda A. Bender, Bill D. Bielby, Albert L. Gibson
Theatre Technician: Ronald Skolmen
Artist-in-Residence: Charles Lampkin

The Department of Theatre Arts provides course work leading to the Bachelor of Arts Degree, and produces a number of plays each year in the Louis B. Mayer Theatre and the Fess Parker Studio Theatre.

The Degree Programs

The department offers the degree of Bachelor of Arts in Theatre Arts with three distinct areas of emphasis: a program in dramatic art, a program in dramatic literature, and a program in dance.

The Dramatic Art Program. The theatre major consists of five lower division and eight upper division courses in Theatre Arts. Normally, these courses include: 10; 20; 30; either 31 or 32; 60; 150; 171; one course designated "design" or "directing;" two courses from the dramatic literature series 110 through 119. Changes can be made to accommodate special interests with consent of the student's advisor and approval of the Chairman.

Students who expect endorsement from the Department for graduate training in acting, directing, or design, or for apprentice programs in the professional theatre should take elective courses inside and outside of the Department in areas designed to increase specific skills. Actors are strongly advised to take appropriate courses in acting, music, voice, and dance. Designers and technicians are urged to take all courses in technical production, and related courses in other departments, such as, Basic Design, Basic Drawing, Survey of Art, and Visual Thinking.

All majors in Theatre Arts are expected to participate in the production program of the Department. Course credit is given for accumulated production work at the discretion of the faculty.

The Dramatic Literature Program. This program is designed in cooperation with the Department of English for students whose interests in theatre and drama are primarily academic. The major consists of five lower division and eight upper division courses in Theatre Arts and English. Normally, these courses include: Theatre Arts 10, 60, 110, 112, 113, 114; English 61, 62, 63, and one course from the Shakespeare series. Changes can be made to accommodate special interests with the consent of the student's advisor and approval of the Chairman.

The Dance Program. This is a program for students who wish to concentrate on dance technique and styles and to develop their abilities to use movement creatively. A course of studies can be designed to accommodate individual needs, with the consent of the student's advisor and the approval of the Chairman.

All Theatre Arts majors are strongly advised to take the History of Western Art series (Fine Arts 71, 72, 73) to fulfill their core curriculum requirement in Humanities.

The Theatre Production Programs

In conjunction with its curricular programs, the Department produces a number of plays each year. This program usually includes a season of at least three faculty directed and designed plays in the Mayer Theatre, an unfixed number of faculty and student directed and designed plays in the Fess Parker Studio Theatre, and one major dance presentation. Mayer Theatre productions often include the appearance of a professional guest artist. The studio plays are intended to provide a creative outlet for beginning actors, playwrights, and directors, and to provide an opportunity for experiment and innovation in theatre art. All members of the University Community are encouraged to audition or provide technical support for the Theatre Arts production program.

1. FUNDAMENTALS OF SPEECH
A basic course in oral communication, stressing the practice of extemporaneous speaking. Content, organization, and delivery of informative and persuasive talks.

3. SPEECH FOR TEACHERS
A basic course in oral communication designed especially for prospective teachers. Oral reading, storytelling, speech and diction.

10. INTRODUCTION TO THEATRE ARTS
A basic study of theatre as a performing art. The functions and techniques of the theatre artist. Vocabulary of the theatre. Representative plays studied as pieces to be performed.

20. BEGINNING ACTING
Improvisation and role playing. Analysis of skills and problems of individual students. Introduction to creative method. Sensitizing of physical and mental tools.

21. BASIC SKILLS FOR ACTORS
Voice production, diction, movement, fencing, make-up. Prerequisite: TA 20 or equivalent.

29. REHEARSAL AND PERFORMANCE
Accumulated production credit given in the Spring term based on quality and quantity of major and minor roles and technical duties during previous three terms. Prior permission of faculty is required.

30. BASIC STAGECRAFT
Principles and techniques of stagecraft. Stage nomenclature. Handling scenery, power and hand tools. Modern production methods.

31. BASIC COSTUME CONSTRUCTION
Introduction to making costumes. Pattern drafting, sewing techniques, fabric studies.

32. BASIC LIGHTING AND SOUND
Principles and practice of stage lighting and sound. Elementary design theory and practice.

38. TELEVISION OPERATION I
Introduction to basic television studio operation. Students receive "hands-on" experience with television lighting, audio and camera operation.

39. TELEVISION OPERATION II
Continuation of television studio techniques, including scripting, staging and camera blocking. Prerequisite: TA 38.

40. DANCE COMPOSITION I

41. DANCE COMPOSITION II

42. DANCE COMPOSITION III

43. BASIC DANCE I

44. BASIC DANCE II

45. BASIC DANCE III

46. INTERMEDIATE DANCE I

47. INTERMEDIATE DANCE II

48. INTERMEDIATE DANCE III

49. DANCE NOTATION

60. INTRODUCTION TO DRAMA
An elementary study of drama as a literary form. Dramatic structure, genres, and styles. Basic problems of interpretation.

70. THEATRE GRAPHICS
Introduction to graphic representation. Drafting, mechanical perspective, freehand drawing, color and design directed toward theatrical design experience.

110. CLASSICAL DRAMA
See English 110.

112. MODERN DRAMA
A study of continental drama from Ibsen to the Theatre of the Absurd in translation. Emphasis on the avant-garde.

113. ENGLISH DRAMA I
See English 113.

114. ENGLISH DRAMA II
Drama in England since the Restoration. Dryden, Wycherley, Congreve, Sheridan, Shaw, Eliot, and selected contemporary playwrights.

116. SHAKESPEARE'S TRAGEDIES
See English 116.

117. SHAKESPEARE'S COMEDIES
See English 117.

118. SHAKESPEARE'S HISTORIES AND SONNETS
See English 118.

119. AMERICAN DRAMA
A study of drama in the United States from 1787 to the present. Emphasis on the 20th century.

122. SCENE STUDY
Scene interpretation for the actor. Analysis of dramatic content. Relationships. Focus. Prerequisite: TA 20 or equivalent.

123. CHARACTERIZATION
A detailed study of creative method in role development. Nature and elements of characterization for the actor. Prerequisite: TA 20 or equivalent.

129. REHEARSAL AND PERFORMANCE
Accumulated production credit given in the Spring term based on the quality and quantity of major and minor roles and technical duties during previous three terms. Prior permission of faculty is required.

130. ADVANCED STAGECRAFT
Experience with the tools of stagecraft in form and structure. Development of skills in metal work, welding, special materials and property construction techniques. Prerequisite: TA 30. Alternate years.

133. SCENE DESIGN
Application of graphic skills to theatrical design. Script interpretation in visual terms. Styles of design. Scene painting and set decor. Prerequisites: TA 30 and TA 70. Alternate years.

134. HISTORY OF COSTUME
History of costume in Western world from ancient times to the present. Traditional and conventional stage costumes. Alternate years.

135. COSTUME DESIGN
Principles of costume design for the stage. Fabrics and special materials. Rendering. Style problems. Prerequisites: TA 31, and TA 134. Alternate years.

137. CHILDREN'S THEATRE AND CREATIVE DRAMATICS
A study of plays and production methods for young audiences. Story theatre. Dramatics as a stimulus to imagination and social growth. Alternate years.

140. MODERN DANCE I

141. MODERN DANCE II

142. MODERN DANCE III

143. BALLET I

144. BALLET II

145. BALLET III

146. CHOREOGRAPHY I

147. CHOREOGRAPHY II

148. CHOREOGRAPHY III

149. HISTORY OF DANCE

150. HISTORY OF THE THEATRE
A study of the physical theatre, production theory and practice, acting styles, and methods of staging from the ancient Greeks to the Romantic Movement. Alternate years.

151. THEORY AND PRACTICE
A detailed study of selected theatre practitioners, their theories and techniques, from the early Realists to the present. Alternate years.

160. THEATRE ADMINISTRATION
Functions and techniques of the producer, business manager, house manager, stage manager, treasurer and publicist. Alternate years.

165. TELEVISION PRODUCTION PLANNING
Theory and practice of organizing and producing a television program. Emphasis on pre-production planning, scripting, program finance and material clearance. Prerequisite: TA 39.

167. ADVANCED TELEVISION DIRECTING AND PRODUCING
The duties of producer/director. Students direct and produce more complicated television productions. Prerequisite: TA 165.

170. PLAYWRITING
Critical analysis of dramatic structure and dramaturgic techniques. Writing of original plays. Alternate years.

171. PLAYSCRIPT INTERPRETATION
Analysis and interpretation of the playscript for the theatre artist. Structure, meaning, style, and tone investigated in a variety of dramatic forms. Alternate years.

172. THEORY OF DIRECTING
A basic course in the problems, techniques, and theory of directing plays. Case studies. Alternate years.

173. DIRECTING PRACTICE
A two-quarter project in directing, commencing Winter term. Students direct one short play each term. Prerequisites: TA 171 and TA 172 or equivalents. Alternate years.

180. CREATIVE PROJECTS
Projects in acting, directing, dance, technical production, design, playwriting, stage management, or theatre administration initiated by the student. May be taken only by students who have exhausted course possibilities in chosen topic. Credit given by pre-arrangement with appropriate staff member. Permission of Department Chairman required. Majors only.

186. SPECIAL TOPICS IN DRAMA
Course reserved for special topics in dramatic literature. May be repeated for credit as topic varies.

190. INDEPENDENT STUDY

198. PRACTICUM

THE COLLEGE OF SCIENCES

John B. Drahmann, Ph.D., *Dean*

DEGREE PROGRAMS

Bachelor of Science
Bachelor of Combined Sciences

The College of Sciences offers major programs leading to the degree of Bachelor of Science in the areas of Biology, Chemistry, Mathematics, Physics, Economics, Political Science, Sociology and Psychology. A program of study leading to the degree of Bachelor of Combined Sciences is also available.

ACADEMIC INFORMATION

Freshmen and sophomores, except for Honors students and Advanced Placement students, are normally restricted to lower-division courses (numbered 1 to 99). Juniors and seniors are expected to take at least 12 upper-division courses (numbered 100 to 199).

Undergraduate work in the College of Sciences is measured in terms of number of completed courses. No credit is given for less than a full course and no special credit is given for laboratory work.

Credit by examination may be earned according to the rules specified in the section, "Academic Requirements and Regulations," except for courses involving laboratory work, seminar courses, or courses labeled NCX. Course descriptions indicate where laboratory is required.

COLLEGE OF SCIENCES

The College of Sciences requires that for a Bachelor of Sciences degree the candidate complete 175 quarter units; of these at least 60 must be earned in upper division courses taken during the junior and senior years.

In addition to the requirements of his major department, the student must meet the following general education requirements:

*English: Two courses in composition and literature.

Humanities: Four courses selected from any of the academic areas in the College of Humanities, but with no more than two courses in any one discipline.

Social Sciences: Two courses selected from the areas of Psychology, Anthropology, Sociology, Economics, Political Science and Geography.

Natural Sciences: Two courses in the natural sciences, or, one course if it has a laboratory associated with it.

Mathematics: Two courses.

Contemporary Issues: One course in the general area of Ethnic Studies

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*For students who intend to earn a Secondary Credential, four courses in English are required. One of these must be in Advanced English Composition.

COLLEGE OF SCIENCES
DEPARTMENT OF BIOLOGY

Thomas N. Fast, Ph.D., *Acting Chairman*

Professors: Francis R. Flaim, John S. Mooring
Associate Professors: Thomas N. Fast, Geraldine A. Tomlinson
Assistant Professors: William R. Eisinger, Peter N. D'Eliscu, Leo J. Hombach, S.J.
Adjunct Lecturers: Linda D. Caren, Richard E. Grindeland, Lanny C. Keil

The biology curriculum reflects the recent expansion of, and changes in, the life sciences. All students take a basic core curriculum — the "Thirty Series" — and then elect advanced courses. A graduate is then prepared to enter professional or graduate schools, to find employment in many areas of the life sciences, or upon certification, teach biology in secondary schools. The present Biology Curriculum satisfies the requirements for a Single-Subject Credential Program in Education (p. 55).

Students who wish to make biology their major subject are required to fulfill the general requirements of the College of Sciences and complete the following for the Bachelor of Science degree:

1. Biology 30, 31, 32, 33, and 34; Chemistry 1, 2 and 35, 36.
2. Physics 4, 5, 6 or Physics 1 and 2.
3. A minimum of seven upper-division biology courses, five of which must include laboratory; these are to be selected in consultation with their faculty advisor.
    a) Students will be required to complete at least one course from each of the following categories: Animal, Plant, Cell, and Population Biology. A single course may not satisfy the requirement in more than one category.
    b) An overall C average must be maintained in the upper-division courses.
    c) Each candidate for a degree is required to pass a comprehensive examination during the last year of residence. The examination is given on the second Wednesday of the Spring Term. All students registered as seniors that quarter must pass this examination even though they might not graduate in June. Under unusual or exceptional circumstances the Graduate Record Examination in Advanced Biology may be substituted with departmental approval.
4. Chemistry 10, and 37 and Math 8 (statistics) are desirable for all and should be taken by those who plan professional studies in medicine, dentistry, or biology.
5. Although not a departmental requirement, students aspiring for graduate schools are strongly advised to study German and/or French.
6. Math 11, 12, 13 (Calculus), are recommended to all prospective candidates to graduate or professional schools; Math 6, 7 are satisfactory for other students.

Honors Program

An Honors student in Biology is eligible for Biology 195 and is also eligible to take Honors courses in other departments. In addition, a student who demonstrates competence in a particular field of biology may, with the departmental approval, carry out independent research in conjunction with regularly offered courses.

7. ANATOMY
Detailed study of mammalian tissues and organ systems with introduction to embryology. Non-majors only. Laboratory 30 hours.

8. PHYSIOLOGY
Elementary vertebrate physiology. Functions of organs and organ systems. Non-majors only. Laboratory 30 hours. Prerequisite: Biology 7 or equivalent.

30. CELLS AND HEREDITY
An introduction to cell biology including a descriptive study of plant and animal cells and their organelles as well as an examination of Mendelian genetics. Laboratory 30 hours. Prerequisite: Concurrent enrollment in Chemistry 1.

31. BOTANY
A survey of the plant kingdom combined with an introduction to plant morphology, anatomy, physiology and development. Laboratory 30 hours. Prerequisites: Biology 30, Chemistry 1 and concurrent enrollment in Chemistry 2.

32. ZOOLOGY
The animal kingdom, classification, embryology, anatomy and function of invertebrate and vertebrate organisms and organ systems. Laboratory 30 hours. Prerequisite: Biology 30 and Chemistry 2.

33. THE BIOLOGY OF POPULATIONS
A survey of the physical and biological factors that distribution and abundance of organisms. Laboratory 30 hours. Prerequisites Biology 31, 32 or equivalent.

34. CELL BIOCHEMISTRY AND PHYSIOLOGY
An introduction to the metabolic processes of cells, including the biochemistry of cell components: p^H, p^K and buffers. Anabolism and catabolism of carbohydrates, lipids, proteins and nucleic acids. Laboratory 30 hours. Prerequisites: Biology 30, Chemistry 35 and 36 (Chemistry 36 may be taken concurrently) or permission of instructor.

80. INTRODUCTION TO MARINE SCIENCE
Biology of the marine environment, including a survey of marine organisms and their adaptations to various habitats. Physical and chemical factors in oceanography, marine pollution. Non-majors only; spring term only.

99. SPECIAL TOPICS
Investigation of a specific area or topic in the biological sciences. Open to non-majors as well as majors.

101. VERTEBRATE ANATOMY
Comparative structure, organization, adaptation, classification. Laboratory 60 hours. Prerequisite: Biology 30, 32 or equivalent. Fall Term only.

104. BIOLOGY SEMINAR
Selected topics in biology. NCX* Prerequisite: Upper division standing in biology.

107. HISTOLOGY AND CYTOLOGY
Protoplasm, cells, basic tissue types, structure and histogenesis. Basic histological techniques. Laboratory 60 hours. Prerequisite: Biology 32, 34 or equivalent.

110. GENETICS
Basic principles governing inheritance in plants and animals. Laboratory 30 hours. Prerequisite: Biology 30, 34 and Chemistry 35 and 36 or equivalents.

112. PATHOGENIC MICROBIOLOGY
Examination of pathogenic microorganisms, diseases, diagnosis, immunological techniques. Laboratory 60 hours. Prerequisite: 113.

113. GENERAL MICROBIOLOGY
Characteristics of microorganisms: bacteria, fungi, viruses, rickettsiae. Identification, isolation, morphology, physiology, bacterial genetics. Laboratory 50 hours. Prerequisites: Biology 30 and 34, Chemistry 35, or permission of instructor.

114. IMMUNOLOGY
Principles, mechanisms and techniques of humoral and cellular aspects of the immune response, including immediate and delayed hypersensitivity, tissue transplantation, tumor immunology and immunodeficient states in humans. Prerequisite: Biology 113.

115. DIFFERENTIATION AND DEVELOPMENT
Developmental phenomena as observed in cells and animals with special emphasis on gene interaction in differentiation, morphogenesis, and growth. Laboratory 30 hours. Prerequisite: Biology 110 or equivalent.

118. GENERAL PARASITOLOGY
Parasitic animals and plants, evolution and energetics of symbiotic interactions, medically important parasites and vectors, parasite-host adaptations and physiology. Laboratory and field work 60 hours. Prerequisite: Biology 32 or equivalent. Alternates with Biology 140.

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*Exempted from challenge.

124. ANIMAL PHYSIOLOGY
A comparative study of organs and organ systems among vertebrates and invertebrates. Laboratory 60 hours. Prerequisite: Biology 32, 34 or equivalent.

125. PLANT PHYSIOLOGY
An examination of the physiological processes of plants with an emphasis on current research in the field. Laboratory 30 hours. Prerequisite: Biology 31, 34 and Chemistry 35, 36.

128. PLANT DEVELOPMENT
Study of plant development with emphasis on the experimental approach and current research. Laboratory 30 hours. Prerequisite: Biology 31 and 125.

130. ECONOMIC BOTANY
A critical analysis of plant food production potentials with special consideration of modern approaches to pest control. Prerequisite: Biology 31 or equivalent.

132. FIELD BOTANY
Field study of vascular plants, especially the seed plants of California; their identification, distribution, and ecology. Laboratory 60 hours. Prerequisite: Biology 31 or equivalent. Spring Term only.

140. INVERTEBRATE BIOLOGY**
Invertebrate physiology, anatomy, behavior, and ecology, with emphasis on the fauna of California. Laboratory and field work 60 hours. Prerequisite: Biology 32 or equivalent. Alternates with Biology 118.

156. GENERAL ECOLOGY
Plant and animal populations, habitats, relationships, and adaptations. Laboratory and field work; community analysis, measurements of physical factors. Laboratory and field work 30 hours. Prerequisites: Biology 33, Math 8.

157. MARINE ECOLOGY
Biology of the marine environment, emphasizing community and population interactions with biotic and physical factors. Diversity, energetics, and population ecology of marine organisms. Laboratory and field work 60 hours. Prerequisite: Biology 156.

171. CHEMICAL BIOLOGY*
Chemistry of biologically important compounds. Reactions and interactions of amino acids, proteins, carbohydrates, lipids, nucleic acids, hormones, vitamins and steroids. Nutrition. Energy relationships in biological systems.

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*Exempted from challenge.

**Not offered in 1977-78.

Prerequisites: Biology 34 (with a grade of C+ or better) and Chemistry 37 or permission of instructor. NCX*.

172. BIOCHEMICAL TECHNIQUES
A laboratory course designed to acquaint those students who have had a lecture course in advanced biochemistry with classic and current biochemical techniques. Prerequisites: Biology 34 and 171 (or equivalent courses) with a grade in each of C+ or better, or permission of instructor. Laboratory 80 hours.

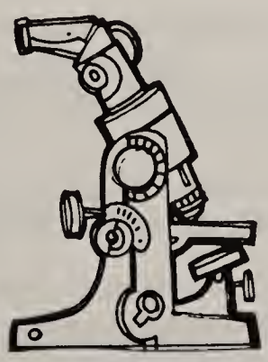
173. EVOLUTION**
The basic principles of organic evolution, with emphasis upon the modern synthetic Theory of Evolution. Prerequisite: Biology 110.

180. PRINCIPLES OF HUMAN HEREDITY
A study of human reproductive mechanisms, hereditary patterns and transmission, and the role of genes in development. Designed for non-majors only. Previous biology course or permission of instructor required.

190. CONTEMPORARY ISSUES IN BIOLOGY
A specialized treatment of some aspect of biology which is of current interest to the biologist as well as to society in general. Prerequisites will be specified according to topic.

195. SPECIAL PROBLEMS*
Supervised laboratory research culminating with a written report suitable for publication. Sustained for one year with credit given for one term. Prerequisite: Departmental Permission. NCX*

199. INDEPENDENT STUDY IN BIOLOGY
Detailed investigation of specific topics in biology under the close direction of a faculty member. Prerequisite: Departmental permission. NCX*



*Exempted from challenge. **Not offered 1977-78

COLLEGE OF SCIENCES
DEPARTMENT OF CHEMISTRY

William F. Sheehan, Ph.D., *Chairman*

Professors: Joseph F. Deck, William F. Sheehan
Associate Professors: Lawrence C. Nathan, Robert J. Pfeiffer, Michael A. Sweeney
Assistant Professor: David White

The Department of Chemistry offers two baccalaureate degrees: (1) Bachelor of Science in Chemistry (Certified by the American Chemical Society), and (2) Bachelor of Science with a major in Chemistry.

Bachelor of Science in Chemistry (Certified)

This four-year curriculum provides graduates with the training necessary to enter work as chemists in various industrial and governmental laboratories or to transfer upon graduation to institutions offering advanced degrees in Chemistry or Medicine. The American Chemical Society certifies that this degree meets all its recommended standards for the professional training of chemists. High School preparation should include algebra, geometry, trigonometry, physics, and chemistry.

Requirements for Bachelor of Sciences in Chemistry (Certified)

Requirements in Major. Chemistry 1, 3, 11, 35, 36, 37. Chemistry 101, 110, 112, 151, 152, 153, 180, and two additional upper division chemistry courses. One upper-division course in Physics, Mathematics, or Biology may be substituted for an upper-division course in Chemistry not explicitly specified.

Required Supporting Courses: Mathematics 11, 12, and 13. Physics 4, 5, and 6.

Recommended Supporting Course: Mathematics 21.

A grade-point average of 2.0 or more for all chemistry courses undertaken is required for admission to, or retention in, this program. A reading knowledge of German or Russian is ordinarily required, and the student must pass an examination in the language of choice administered by competent faculty.

Honors Program

Students of superior ability who enroll for either chemistry degree may apply for admission to the Honors Program.

Bachelor of Science with a Major in Chemistry

This four-year program provides a liberal scientific degree with emphasis on the central science that lies between physics and biology. It offers chemical training for those planning to obtain work of a broad technical nature, either in scientific laboratories or in fields allied in chemistry. This program will suffice for careers in patent law, library work, teaching, or business or industries having chemical products. This program will adequately prepare the student for entrance into medical, dental or any other program dealing with the health, geological, agricultural, or materials sciences.

High school preparation should include algebra, geometry, trigonometry, and chemistry.

Requirements for Bachelor of Science with a Major in Chemistry

Requirements in Major: Chemistry 1, 3, 11, 35, 36, 37, 110, 112, 151, 152. Besides Chemistry 110, 112, 151, and 152, a student must take five upper division chemistry courses, of which three may be biology, mathematics or physics, all in the upper-division. At least one of these five elective upper-division courses must have a laboratory. Students interested in the health sciences would select Biology as the science other than Chemistry. A grade-point average of 2.0 or more for all chemistry courses undertaken is required.

Required Supporting Courses: Physics 1, 2, or 4, 5 and 6. Mathematics 11, 12, and 13.

NB. The following pairs of courses are the same in content and scheduling except for laboratory work: 2 and 4, 31 and 35. Laboratory courses require a deposit for breakage and chemicals. See Student Expenses.

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1. GENERAL CHEMISTRY I

Atomic Structure. Periodic Properties and the Periodic Table. Nomenclature. Chemical Bonding. Chemical Equations and Quantitative Relationships. Properties of Gases, Liquids, and Solids. Solutions. Equivalent Weights. Oxidation and Reduction. Quantitative determinations in the laboratory exercises. Laboratory 30 hours. Fall Term. Prerequisites: High School Chemistry, Physics, Algebra, Geometry, and Trigonometry.

2. GENERAL CHEMISTRY II

Chemical Kinetics. Equilibrium. Acids and Bases. Ionic Equilibria. Chemical Thermodynamics. Electrochemistry. Molecular Geometry. Properties and Structures of metals, non-metals, and their compounds. Laboratory 30 hours. Prerequisite: CH I. Winter Term.

3. GENERAL CHEMISTRY (HONORS)

Solutions. Electrochemistry. Thermodynamics. Chemical Equilibrium. Ionic Equilibria. Chemical Kinetics. Acids and Bases. Molecular Structure. Chemical Properties. Laboratory 30 hours. Prerequisite: CH 1, Winter Term.

4. GENERAL CHEMISTRY II FOR ENGINEERS

Same as Chemistry 2 but without laboratory. Prerequisite: CH I. Winter Term. NCX*

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*Exempted from challenge.

7. THE ART OF CHEMISTRY
Atomic and Molecular structure. Laws of chemical change. Kinetic Theory. Periodic Table. Chemical Reactions. The nucleus and nuclear reactions. For the non-science student. Laboratory 30 hours. Winter Term.

8. CHEMISTRY IN EVERYDAY LIVING
Atomic structure. Water. Acids and bases. Compounds of carbon. Food chemistry. Plastics. Biochemical reactions. The role of Chemistry in modern life. Laboratory 30 hours. Prerequisite: High school Chemistry or CH 7. Spring Term.

9. CHEMISTRY IN EVERYDAY LIVING
Same as Chemistry 8 but without laboratory. Prerequisite: High school Chemistry or equivalent. Lectures 75 min. daily. Summer Session only. NCX*

10. QUANTITATIVE ANALYSIS FOR BIOLOGISTS
Theories and practice of acidimetry, alkalimetry, and volumetric precipitations. Introduction to theories of oxidimetry and reductimetry. Laboratory 40 hours. Prerequisite: CH 2. Spring Term.

11. QUANTITATIVE ANALYSIS FOR CHEMISTS
Theories and practice of acidimetry, alkalimetry and volumetric precipitations. Introduction to gravimetric analysis. Introduction to theories of oxidimetry and reductimetry. Laboratory work will also include elementary instrumentation. Laboratory 80 hours. Prerequisite: CH 2 or 3. Spring Term.

30. SURVEY OF ORGANIC CHEMISTRY
A survey of the more important classes of organic compounds with emphasis on materials of interest to the students of the biological sciences. Laboratory 30 hours. Intended for students not majoring in chemistry and not planning to take additional courses in organic chemistry. Prerequisite: CH 1 or 7. Spring Term.

31. ORGANIC CHEMISTRY I
Same as Chemistry 35, but without laboratory. NCX*

35. ORGANIC CHEMISTRY I
Structure and bonding in organic compounds. Reactions of alcohols, alkyl halides, alkenes, ethers, aldehydes and ketones. Stereochemistry. Spectroscopy. Introduction to reaction mechanisms and synthesis. Laboratory 40 hours. Prerequisite: CH 2 or 3. Fall Term.

36. ORGANIC CHEMISTRY II
Continued reactions of aldehydes and ketones, dienes, carboxylic acids and derivatives, amines and sulfides. Introduction to concept of aromaticity and reactions of aromatic compounds. Carbohydrates, amino acids, proteins.

Continued synthesis and reaction mechanisms. Lab 40 hrs. Prereq: CH 31 or 35. Winter term.

37. ORGANIC CHEMISTRY III

Further reactions of aromatic compounds. Si and P chemistry. Advanced stereochemistry. Introduction to heterocycles and physical organic chemistry. Lab 40 hrs. Prereq: CH 36. Spring term.

99. SPECIAL TOPICS

Theoretical or experimental study or research supervised by a faculty member whose permission must be received before registration for this course. Any Term. NCX*

101. ADVANCED INORGANIC CHEMISTRY

Atomic structure. Periodic Law. Chemical bonding. Molecular geometry. Crystal Structure. Chemical properties of the elements. Symmetry and group theory. Coordination chemistry. Synthetic inorganic chemistry. Laboratory 30 hours. Prerequisites: CH 11, 36 and 152. (CH 152 may be concurrent.) Spring Term.

110. INSTRUMENTAL METHODS OF ANALYSIS

Principles and use of instruments. Ultraviolet, visible, infrared, raman, nuclear magnetic resonance, and atomic absorption spectroscopy. Selected electroanalytical methods. Magnetic susceptibility. Theory of X-ray diffraction. Introduction to computer methods in chemistry. Laboratory 45 hours. Prerequisites: CH 11, 37, 152. CH 101 is recommended. Winter Term.

112. ADVANCED QUANTITATIVE ANALYSIS

Advanced volumetric and gravimetric analysis, and aspects of instrumental analysis emphasizing quantitative analysis: Oxidation-reduction equilibria and electrochemical analysis by both instrumental and non-instrumental techniques. Complex ion titrations, instrumental and non-instrumental. Gravimetric analysis. Gas chromatography, theory and practice. Mass spectrometry, theory and workshop. Laboratory 45 hours. Prerequisite: CH 10 or 11, 152. Fall term.

134. ADVANCED ORGANIC CHEMISTRY I

Synthesis and properties of five and six-membered rings with one heterocyclic atom. Brief introduction to other classes. Prerequisites: CH 37. Fall Term. NCX*

135. ADVANCED ORGANIC CHEMISTRY II (PHYSICAL ORGANIC CHEMISTRY)

Molecular orbital treatment of organic molecules. Mechanisms. Structure/reactivity relationships. Photochemistry. Conservation of orbital symmetry. Applications of absorption spectroscopy to organic compounds. Prerequisite: CH 37, 152. Fall or Winter Term. NCX*

136. ADVANCED ORGANIC CHEMISTRY III

Synthesis, biosynthesis and structure determination of acetogenins, isoprenoids and alkaloids. Emphasis on reaction mechanisms and stereochemistry. Prerequisite: CH 37. Spring term. NCX*

140. BIOCHEMISTRY

Nucleic acids, proteins, carbohydrates, lipids. DNA replication, enzymes, bioenergetics, membrane structure. Intermediary metabolism, including biological reaction mechanisms. Prerequisite: CH 36. Fall or Winter Term. NCX*

150. SURVEY OF PHYSICAL CHEMISTRY

States of matter. Thermodynamics and Thermochemistry. Chemical Kinetics. Electrochemistry and Electrodes. Macromolecules, Surface Chemistry and Membrane Phenomena. Radiochemistry. Intended for students majoring in the biological sciences. A term course in calculus is advisable. Prerequisite: CH 10; 31 or 35. Winter Term. NCX*

151. PHYSICAL CHEMISTRY I

Equations of state of pure fluids. Energy and enthalpy. Thermochemistry. Entropy. Free Energy. Chemical potential. Phase Rule. Problems. Laboratory 60 hours. Prerequisites: CH 10 or 11. Mathematics 13. Physics 2 or 6. Winter Term.

152. PHYSICAL CHEMISTRY II

Colligative Properties. Chemical equilibrium. Chemical kinetics. Migration of charged species. Electrochemical cells. Surface Phenomena. Introductory quantum mechanics. Problems. Laboratory 60 hours. Prerequisite: CH 151. Spring term.

153. PHYSICAL CHEMISTRY III

Quantum mechanics. Particle in box. Harmonic oscillator. Hydrogen atom. Variation method. Virial theorem. Molecular structure and spectroscopy. Statistical mechanics. Reaction rate theory. Problems, small and gigantic. Prerequisite: CH 152. Recommended prerequisite: Math 021. Spring Term. NCX*

154. ADVANCED PHYSICAL CHEMISTRY I

Nuclear Chemistry: nuclear structure, radioactive decay, nuclear reactions. Radiochemistry: interaction of radiation with matter; counters, tracers in chemistry. Prerequisites: PH 2 or 6; MA 11; and CH 150 or CH 152 or PH 7. NCX*

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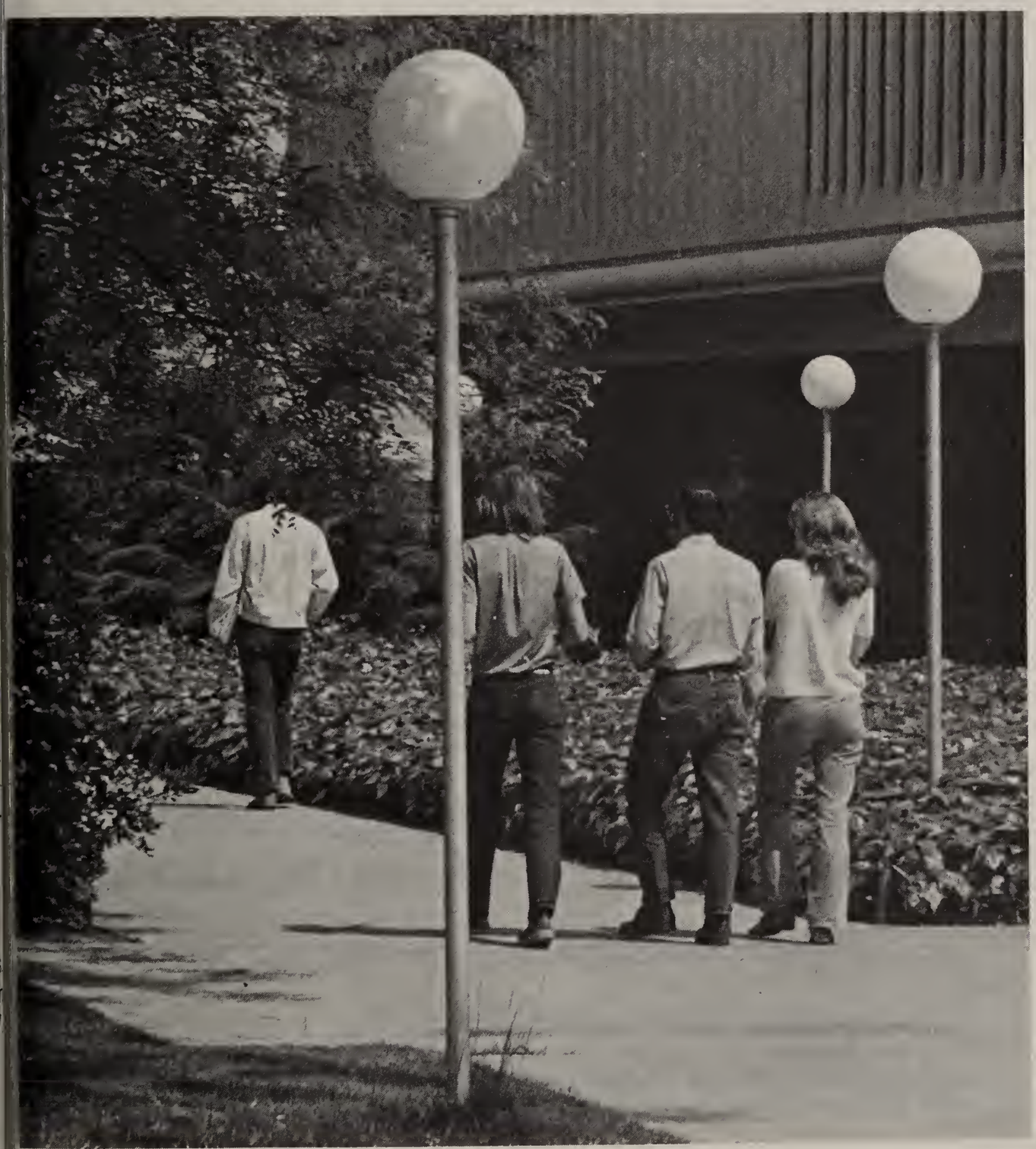
*Exempted from challenge.

180. UNDERGRADUATE RESEARCH AND SEMINAR

Individual research for senior chemistry majors under direction of faculty. Chemical and/or computer laboratory to be arranged. A written report suitable for publication and oral presentation of that report in seminar are required for credit. Regular attendance at seminars is required. Prerequisite: CH 152. Any term.

199. INDEPENDENT STUDY IN CHEMISTRY

Detailed investigation and directed reading on advanced topics, under the close supervision of a faculty member. Permission of the instructor must be obtained before registration. Any term. NCX



COLLEGE OF SCIENCES
BACHELOR OF COMBINED SCIENCES

Dr. Joseph F. Deck, *Director*
Professor of Chemistry

Aware that students now aspire for a real responsibility in getting a true and useful education, the College of Sciences offers its students a curriculum that emphasizes adaptability and freedom. This curriculum would challenge any student to make what he can of the full facilities and all the faculty of the College of Sciences. It incorporates features that respond to real student needs and desires and to the demands that the modern world makes on graduates. The completion of this curriculum will merit a Bachelor of Combined Science Degree (B.C.S.).

Some particular aims of the new program include: 1) appealing alternatives to regular departmental majors, 2) a liberal science degree for modern man in a modern scientific world, 3) an opportunity of keeping open for an unusually long period at Santa Clara the various options of the undeclared science major, 4) a non-specific scientific background for modern jobs that often require only a casual understanding of scientists ability in the traditional sense, as in advising management, legislation, courts, governmental agencies on food and drugs and so on, 5) excellent preparation for the student contemplating the health sciences, such as medicine, dentistry, etc. who has no specific desire for completing programs in the conventional science programs now offered.

The program is so planned that a student would be qualified to take *upper division courses* offered by one or several departments of the College without necessarily establishing a regular departmental major. This scheme reinforces the student's early scientific interests as early as is consistent with reasonable loads, electives, and so on so that upper division work of the preferred kind of science can be started as early as year 3. Yet, by the end of the winter term of year 3, this plan opens the way to any upper division course in the College. This upper-division freedom is admired by students and faculty and distinguishes this plan from most others.

Requirements for Bachelor of Combined Sciences, B.C.S.

Required Courses in the Natural Sciences:

Chemistry 001, 002, 030 (or in place of 030 the 3-term course sequence in organic chemistry if needed), Mathematics 011, 012, and 013, statistics, Physics 004, 005, and 006, or Physics 001, and 002, Biology 030, 032, and 034.

Required Courses in the Social Sciences:

Economics 001, 002, Psychology 010, and 011, Sociology 001, 118, Anthropology 003, and Political Science 001, 002.

Required Courses in the Humanities:

English (two terms), Religious Studies (three terms).

Twelve (12) upper division courses are required for the degree, seven of which must be taken from the College of Sciences. To complete the program of 175 units, additional courses should be elected in the Humanities.

CURRICULUM FOR BACHELOR OF COMBINED SCIENCES DEGREE NATURAL SCIENCES

Fall	Winter	Spring
Chemistry 001	Chemistry 002	Math 013
Economics 001	Economics 002	Religious Studies
English 001	English 002	Statistics
Math 011	Math 012	Physics 004
Biology 030	Religious Studies	Biology 032
Elective (or Chem 035)	Elective (or Chem 036)	Elective (or Physics 007)
Sociology 001	Psychology 010	Psychology 011
Physics 005	Physics 006	Chemistry 030 or 036
Political Science 001	Biology 034	Religious Studies (U/D)
Anthropology 003	Sociology 118	Elective*
Elective*	Political Science 002	Elective*
Elective*	Elective*	Elective*
Elective*	Elective*	Elective*
Elective*	Elective*	Elective*

CURRICULUM FOR BACHELOR OF COMBINED SCIENCES DEGREE SOCIAL SCIENCES

Fall	Winter	Spring
Chemistry 001	Chemistry 002	Math 001
Economics 001	Economics 002	Religious Studies
English 001	English 002	Statistics
Sociology 001	Psychology 010	Psychology 011
Political Science 001	Political Science 002	Religious Studies
Elective	Elective	Math 013
Math 011	Math 012	Physics 004 or Elective
Anthropology 003	Religious Studies	Chemistry 030
Biology 030	Biology 031	Religious Studies (U/D)
Physics 005 or 001	Physics 006 or 002	Biology 032
Elective*	Sociology 118	Elective

(continued)

Elective*	Elective*	Elective*
Elective*	Elective*	Elective*
Elective*	Elective*	Elective*

*Seven of these 12-13 electives must be upper division courses in the College of Sciences; five more upper division courses are also required for graduation. Total quarter units must be at least 175.

COLLEGE OF SCIENCES
DEPARTMENT OF ECONOMICS

Mario L. Belotti, Ph.D., *Chairman*

Professors: Mario L. Belotti, William Donnelly, S.J., J. M. Heineke, Thaddeus J. Whalen, Jr.
Associate Professor: Henry G. Demmert
Assistant Professors: Richard T. Coz, S.J., Masako N. Darrough, Jeffrey Hall, Robert E. Looney, Marshall Medoff, Robert K. Springer

Students majoring in Economics in addition to fulfilling the general requirements for a Bachelor of Science degree, must complete the following departmental requirements:

Freshman and Sophomore years: Economics 1 and 2, Economics 55 (Quantitative Methods 40 may be substituted), and two math courses (preferably Math 11 and Math 12).

Junior and Senior years: Economics 114, 115, and 116. Six upper-division economics electives. (Students may petition to substitute one of the upper-division economics electives with another course.)

SPECIAL PROGRAMS

Emphasis in Mathematical Economics

The Departments of Mathematics and Economics offer jointly a program providing an emphasis in mathematical economics. Students wishing to participate will major in either mathematics or economics but will pursue a special course of study to emphasize the utilization of mathematics in the study of economics; participation in this course of study will be noted on the student's transcript. This program will be especially valuable for students planning graduate work and/or careers in actuarial science, economics, mathematics, operations research, systems engineering and related fields. The core of the program consists of Economics 114, 115, 170, 171 and 177; Mathematics 21, 22, 52, 53, 102; and either Economics 174 or Mathematics 122, 123. Full descriptions of the program may be obtained from the Chairman of the Department of Economics or Mathematics.

Emphasis in Political Economy

The Departments of Economics and Political Science offer jointly a program providing an emphasis in Political Economy. Students wishing to participate will major in either economics or political science but will pursue a special course of study which emphasizes the interdependence of economics and political science in the analysis and solution of current domestic and world economic problems. Participation in this program will be noted in the student's transcript. This program will be especially valuable to students planning graduate work and/or careers in public affairs, law, economics and political science. The core of the program consists of Economics 114, 115, 116, 118 and 120; Political Science 111, 117, 149, 165 and 167. Full descriptions of the program may be obtained from the Chairman of the Department of Economics or Political Science.

Honors Program

In collaboration with other departments of the Social Science Division, the Department of Economics offers to its best students an Honors Program consisting of special seminars and independent studies. Students will be admitted into the Honors Program only upon faculty recommendation.

Lower Division Courses

1. PRINCIPLES OF ECONOMICS I
An introduction to the general principles, terminology, and methods of macroeconomics.

2. PRINCIPLES OF ECONOMICS II
An introduction to the general principles, terminology, and methods of microeconomics.

12. AMERICAN ECONOMIC HISTORY
A study of the economic history of the history of the United States with special emphasis upon basic economic organizations, such as the business enterprise, the labor union, and the economic functions of government.

20. CURRENT ECONOMIC ISSUES I
A study of contemporary macroeconomic problems.
Prerequisite: Economics 1.

21. CURRENT ECONOMIC ISSUES II
A study of contemporary microeconomic problems. Prerequisite: Economics 2.

55. STATISTICS
Introduction to statistical methods and techniques of elementary statistical analysis.

Upper Division Courses

(Economics 1 and 2, or permission of the instructor, is required for all upper-division courses)

114. MICROECONOMICS I
An introduction to the theory of demand production, cost and pricing.

115. AGGREGATE ECONOMIC THEORY
The focus of this course is on the macro, or aggregative aspects of the economy. It emphasizes modern macroeconomic models which aim at explaining the level of output, employment and prices.

116. HISTORY OF ECONOMIC THOUGHT
A study of the evolution of economic ideas and their influence on the development of economic practices. Prerequisites: Economics 114 and 115.

117. EUROPEAN ECONOMIC HISTORY
A study of the preindustrial environment and industrial growth patterns of the western European countries.

118. COMPARATIVE ECONOMICS SYSTEMS
In this course the performance of market economies is contrasted to that of centrally planned, non-market economies and to that of "mixed" economies. The question of performance is addressed from both a theoretical and a practical point of view.

120. ECONOMICS OF THE PUBLIC SECTOR
In this course microeconomic theory will be applied to the analysis of the public sector. Prerequisites: Economics 114.

121. MICROECONOMICS II
The purpose of this course is to acquaint the student with applications of microeconomic theory to familiar economic problems.

122. MONEY AND BANKING
A theoretical, institutional, and historical approach to the study of money and banking, with particular emphasis upon the relationship between the monetary and banking system and the rest of the economy.

124. INDUSTRIAL ORGANIZATION
A microanalysis of the structure, conduct, and performance of American industry. Prerequisite: Economics 114.

125. WELFARE ECONOMICS
A study of the principles by which economists evaluate the social desirability of alternative market arrangements. Prerequisite: Economics 114.

126. ECONOMICS AND THE LAW

An application of the tools of economic theory to the analysis of law and legal institutions as they exist in the contemporary United States. Topics include a theory of property rights, the economics of the common law, income distribution and theories of economic justice, the economics of crime and punishment, antitrust law and regulatory law. Prerequisite: Economics 114 or permission of the instructor.

128. BUSINESS CYCLES AND FORECASTING

A study of the nature and causes of economic instability in an industrial economy.

129. ECONOMIC DEVELOPMENT

An analysis of the historical and theoretical context underlying present efforts to increase the rate of economic growth in underdeveloped countries.

130. LATIN AMERICA ECONOMIC DEVELOPMENT

An examination of the economic development of Latin American countries with particular emphasis on the relationships between economic growth and the social, political and economic structures of these countries.

131. AFRICA ECONOMIC DEVELOPMENT

A study of the economic development of Africa, with particular emphasis upon the relationships between economic growth and the social, political and economic structures of these countries.

132. ASIA ECONOMIC DEVELOPMENT

A study of the economic development of Asian countries with particular emphasis upon the relationships between economic growth and the social, political, and economic structures of these countries.

133. SOVIET ECONOMIC DEVELOPMENT

A study of the economic development of the Soviet Union since the Communist Revolution.

134. GROWTH DYNAMICS AND PLANNING

A study of various theoretical growth models and their application to development, planning and project evaluation. Prerequisites: Economics 114 and 115.

140. URBAN ECONOMICS

This course examines the economics of urban problems with emphasis on location and land use, the housing market, and transportation. The interaction of location and land use decisions with the housing market and the transportation system is analyzed with reference to the amelioration of urban problems. Prerequisite: Economics 114 or permission of instructor.

141. ENVIRONMENTAL ECONOMICS
A course in the application of basic economic principles to question concerned with the appropriate use of environmental resources. Emphasis is on the role of cost/benefit analysis in designing environmental policy. Prerequisite: Economics 114.

150. LABOR ECONOMICS
A study of labor productivity, incomes, employment and how these are affected by labor organizations and labor legislation.

160. THE ECONOMICS OF POVERTY
A study of the economic conditions which lead to poverty and possible alternative policies directed at modifying such conditions.

170. MATHEMATICAL ECONOMICS I
In this course many familiar micro and macro economics models are generalized and reformulated as mathematical systems. Attention is focused on exploring the properties of these models using mathematical techniques. Emphasis is primarily on static models. Prerequisites: Mathematics 11 and 12, Economics 114 and 115, or consent of professor.

171. MATHEMATICAL ECONOMICS II
Analysis of dynamic economic models. Differential and difference equations are used to explore economic growth, technological change and other topics in both macro and micro economics. Selected topics from the economics of uncertainty are also discussed. Prerequisites: Mathematics 11 and 12, Economics 114 and 115, or consent of professor.

174. STATISTICAL ANALYSIS
A course designed to acquaint the student with the foundations of statistical research methods. Topics include distribution theory, estimation, testing, and prediction, with special emphasis upon multivariate models. Prerequisites: Mathematics 11 and 12 or equivalent.

177. ECONOMETRICS
An introduction to the techniques used by economists to estimate and test economic relationships. Focus is on regression analysis, time series problems and estimation of multiple equation models. Prerequisites: Economics 174 or equivalent.

180. INTERNATIONAL ECONOMICS
An analysis of the theory of international trade, of problems in balance of payments adjustments, and of international economic policies. Prerequisite: Economics 114.

188. JUNIOR HONORS SEMINAR
Modern economic theories and problems. Reserved for Honors students.

189. SENIOR HONORS SEMINAR
Modern economic theories and problems. Reserved for Honors students.

190. INDEPENDENT STUDY

191. INTERNSHIP
Opportunity for selected upper division students to work in local governmental units or firms. Prerequisite: Upper division standing and approval of the Undergraduate Committee.

COLLEGE OF SCIENCES
DEPARTMENT OF MATHEMATICS

Gerald L. Alexanderson, M.S., *Chairman*

Professors: Gerald L. Alexanderson, Karel L. de Bouvere, S.C.J.
Associate Professors: Vladimir Drobot, Grant A. Fraser, Leonard Klosinski
Assistant Professors: James Foster, Nicholas Knueppel,
David E. Logothetti, Dale H. Mugler
Jean J. Pedersen
Adjunct Lecturers: V. E. Hoggatt, Jr., Alice J. Kelly, Marijean Seelbach

The Department of Mathematics offers work leading to a major or a minor in mathematics, as well as required and elective courses for students majoring in other fields. The major may be pursued with three principal goals in mind: preparation for graduate work in mathematics or other related fields leading to advanced degrees; preparation for secondary school teaching of mathematics; preparation for a career in research for industry or government.

Graduate work is offered in the Department for the degree Master of Science in the Teaching of Mathematics; for a description of this degree, see the *Graduate School of Humanities Bulletin*. For a description of the degree Master of Science in Applied Mathematics offered by the School of Engineering, see the *Graduate Programs Bulletin of the School of Engineering*. In addition, the major in mathematics may be taken with an emphasis in mathematical economics or an emphasis in computer science.

Requirements for the Bachelor of Science Degree

Students majoring in mathematics are required to take lower-division courses numbered 11, 12, 13, 21, 52, and 53, together with an approved selection of seven upper-division courses (numbered above 100). The upper-division courses must include 102 and either 111 or 176 (or both.) Students planning graduate work in pure mathematics should plan to choose 111; those planning work in computer science or other applications may substitute 176. In addition, students planning to go on to graduate school should take 105, 112, 153 and 154. Specific admission to upper division standing must be obtained by the student before he is allowed to undertake the more advanced courses; this permission will be granted only to students whose performance in lower-division courses clearly indicates the aptitude and interest necessary for advanced work.

Majors in mathematics are required to take Physics 4 to satisfy their natural sciences requirement. An additional course, usually Physics 5, is required of all mathematics majors. This additional course may, however, be Economics 170, 171 or 177 if the student has a special interest in mathematical applications in the social sciences or economics. Majors intending to become teachers of mathematics in secondary schools may substitute Physics 1 and 2 for the above courses, with the approval of the Chairman of the Department.

Physics 131 and 132, Introduction to Mathematical Physics I and II, may be taken to satisfy departmental requirements in mathematics.

Majors in mathematics are required to demonstrate ability to read a mathematical work in French, German or Russian prior to graduation.

Emphasis in Computer Science

For those planning graduate studies in computer science or careers in research in government or industry, the Department offers an emphasis in computer science. Such students should include in their programs Mathematics 64, 164, 165, 166, 176 and may wish to include Engineering 15.

Emphasis in Mathematical Economics

The Departments of Mathematics and Economics offer jointly a program providing an emphasis in mathematical economics. Students wishing to participate will major in either mathematics or economics but will pursue a special course of study to emphasize the utilization of mathematics in the study of economics; participation in this course of study will be noted on the student's transcript. This program will be especially valuable for students planning graduate work and for those planning careers in actuarial science, economics, mathematics, operations research, systems engineering and related fields. The core of the program consists of Economics 114, 115, 170, 171, 177; Mathematics 21, 22, 52, 53, 102; and either Economics 174 or Mathematics 122, 123. Full descriptions of the program may be obtained from the Chairmen of the Departments of Economics or Mathematics.

Honors Program

The Department maintains a program for the discovery, encouragement and development of mathematical talent among undergraduates. This program includes special sections, seminars, individual conferences and directed study guided by selected faculty members. An active Undergraduate Research Participation Project is directed by members of the Department.

1. ALGEBRA AND TRIGONOMETRY
Topics in college algebra and trigonometry. Intended for students who wish to take further work in mathematics. Permission to enroll must be obtained from the Chairman of the Department.

2. MATHEMATICS FOR ELEMENTARY SCHOOL TEACHERS
Topics include sets, number systems, inequalities and equations, and other basic topics in modern mathematics.

3. THE NATURE OF MATHEMATICS
A course designed for liberal arts students. Topics will be chosen to allow students to participate in the discovery and development of mathematical ideas. Some discussion of the history of mathematics is included.

6. MATHEMATICAL ANALYSIS FOR SOCIAL SCIENCE I
An introduction to finite mathematics with applications to the social sciences. Sets, logic, combinatorial problems, probability, vectors and matrices.

7. MATHEMATICAL ANALYSIS FOR SOCIAL SCIENCE II
An introduction to differential and integral calculus with applications to the social sciences. Mathematics 7 and Mathematics 11 cannot both be taken for credit.

8. INTRODUCTION TO STATISTICS
Elementary topics in statistics chosen from: descriptive statistics, probability, random variables and distributions, sampling, estimation, hypothesis testing, regression and correlation. Prerequisite: 1 or equivalent.

11. ANALYTIC GEOMETRY AND CALCULUS I
Differentiation and applications, integration. Mathematics 7 and Mathematics 11 cannot both be taken for credit. Prerequisite: four years of high school mathematics (including trigonometry) or satisfactory grade in 1.

12. ANALYTIC GEOMETRY AND CALCULUS II
Continuation of 11. Applications of integration, transcendental functions, determinants and linear equations.

13. ANALYTIC GEOMETRY AND CALCULUS III
Polar coordinates, hyperbolic functions, vectors, parametric equations, solid analytic geometry, partial differentiation. Prerequisite: 12.

21. CALCULUS AND DIFFERENTIAL EQUATIONS
Multiple integration. Infinite series. Complex numbers and functions. Introduction to ordinary differential equations. Prerequisite: 13.

22. DIFFERENTIAL EQUATIONS
Use of series, numerical and transform methods in solving differential equations. Introduction to partial differential equations. Prerequisite: 21.

32. MATHEMATICAL LOGIC
Introduction to formal methods in elementary logic; propositional calculus and simple predicate calculus. Connections with set theory and algebra. Recommended as an elective for mathematics majors and other students planning to pursue further work in logic and foundations. Recommended for 133.

52. INTRODUCTION TO MODERN ALGEBRA
Groups, fields, integral domains, applications to number theory. Polynomials and polynomial equations.

53. LINEAR ALGEBRA
Vector spaces, linear transformations, algebra of matrices, quadratic forms, characteristic equations.

64. INTRODUCTION TO COMPUTER SCIENCE
Elementary FORTRAN programming. General structure of computers. Design and programming of algorithms including the approximation of roots, numerical integration and numerical solution of differential equations.

99. LOWER-DIVISION SEMINARS
Basic techniques of problem solving and topics in algebra, geometry, and analysis.

101. A SURVEY OF GEOMETRY
Topics from projective, advanced Euclidean and non-Euclidean geometries.

102. ADVANCED CALCULUS
Vector calculus, functions of several variables, elliptic integrals, line integrals, uniform convergence, introduction to Fourier series.

105. THEORY OF FUNCTIONS OF A COMPLEX VARIABLE
Analytic functions, Cauchy integral theorems, power series, conformal mapping. Riemann surfaces. Prerequisite: 153.

107. MODERN ELEMENTARY MATHEMATICS I
Designed for in-service secondary school teachers. Topics in elementary mathematics treated in a manner emphasizing the underlying structure and fundamental concepts. (107 and 108 may not be taken to fulfill the requirements of a major in mathematics.)

108. MODERN ELEMENTARY MATHEMATICS II
A continuation of 107. This course may be taken independently of 107 upon the consent of the instructor.

111. ABSTRACT ALGEBRA I
Topics from the theory of groups. Prerequisites: 52 and 53.

112. ABSTRACT ALGEBRA II
Rings and ideals, algebraic extensions of fields, Galois Theory. Prerequisite: 111.

113. TOPOLOGY
Set theory insofar as pertinent to the course. Topological spaces, continuous functions, product spaces. Separability and compactness. Metric spaces and metric topologies.

122. PROBABILITY AND STATISTICS I
Axioms and postulates; combinatorial problems; conditional probability; independence; random variables, distributions. Prerequisite: 21.

123. PROBABILITY AND STATISTICS II
Expectation; characteristic functions; infinite sequences of random variables; point estimation; statistical hypotheses; confidence intervals.

133. LOGIC AND FOUNDATIONS
Deductive theories. Theories and models. Consistency, completeness, decidability. The theory of models. The cardinality of models. Some related topics of metamathematics and foundations. This course is open to upper division students of science and mathematics and to philosophy majors having sufficient logical background. Prerequisite: 32 or equivalent.

134. SET THEORY
Naive set theory. Cardinal and ordinal arithmetic. The axiom of choice and the continuum hypothesis. Axiomatic set theory.

144. PARTIAL DIFFERENTIAL EQUATIONS
Special topics in higher mathematics useful in applications to the physical sciences, such as special functions of mathematical physics. Fourier series, partial differential equations, and boundary value problems.

153. INTERMEDIATE ANALYSIS I
A rigorous investigation of the real number system. Concepts of limit, continuity, differentiability of functions of one real variable, theorems of differential and integral calculus. Prerequisite: 102.

154. INTERMEDIATE ANALYSIS II
A continuation of 153.

155. ORDINARY DIFFERENTIAL EQUATIONS
Existence and nature of solutions; oscillation theory, orthogonal functions. Partial differential equations. Prerequisite: 102.

164. COMPUTER SCIENCE I
Machine language programming. Mathematical logic and logical design of a digital computer. Turing machines. Prerequisite: 64 or equivalent. NCX

165. COMPUTER SCIENCE II
Advanced programming with emphasis on simulation techniques, linear programming, grammars, machines, and languages. Prerequisite: 64 or permission of instructor. NCX

166. NUMERICAL ANALYSIS
Interpolation formulas. Numerical differentiation and integration. Numerical solution of algebraic, transcendental, and differential equations. Prerequisite: 102.

168. DIFFERENTIAL GEOMETRY
Introduction to curves and surfaces. Differential forms, Frenet formulas, frame fields, differentiation on surfaces. Prerequisite: 53.

170. DEVELOPMENT OF MATHEMATICS
A selection of mathematical concepts given with their historical context. Upper-division standing in a science major is required.

172. PROBLEM SOLVING
Use of induction, analogy, and other techniques in solving mathematical problems.

175. THEORY OF NUMBERS
Fundamental theorems on divisibility, primes, congruences. Number theoretic functions. Diophantine equations. Quadratic residues. Partitions.

176. COMBINATORICS
Permutations and combinations, generating functions, recursion relations and a selection of topics from combinatorial geometry, graph enumeration, Polya counting theorem.

179. MATRIX THEORY
Linear transformations, matrices and determinants, quadratic forms, Cayley-Hamilton Theorem.

190-195. INDEPENDENT STUDY
Reading and investigation for superior students under the direction of a staff member.

196. ADVANCED TOPICS
A course offered each year in an advanced area of mathematics not ordinarily covered in the regularly offered courses, often in an area of current interest.

199. UPPER DIVISION SEMINARS
Advanced topics in algebra, geometry, or analysis. Research projects.

(Note: Some upper-division courses, e.g., 133, 134, 144, 155, 164, 165, 166, 172, 175, 176, are given only in alternate years.)

COLLEGE OF SCIENCES
DEPARTMENT OF PHYSICS

William T. Duffy, Jr., Ph.D., *Chairman*

Professors: William A. Barker II,
John B. Drahmann, *Dean,* College of Sciences,
William T. Duffy, Jr., Carl H. Hayn, S.J.,
Philip T. McCormick
Professorial Lecturer: Alexis I. Mei, S.J.
Visiting Assistant Professor: Frederick M. Weinhaus

The Department of Physics offers a program of lecture and laboratory instruction designed to satisfy the needs of three categories of students: the student majoring in physics; the science or engineering student who is not a physics major but in need of a solid introduction to physics; the business, humanities, or social science student who needs a descriptive introductory course.

Physics 1 and 2 are a non-calculus introductory sequence particularly suitable for premedical and predental students. Physics 3 and Physics 50 are designed to provide mainly descriptive introductions to astronomy and earth science, respectively. Physics 4, 5, 6 and 7 are designed for the science or engineering major to provide a thorough introduction to classical and modern physics, making extensive use of the calculus.

The physics *major* is usually pursued with one of three goals in mind: graduate study in physics or related fields, professional employment by industry or government, or secondary school teaching in physical science. The undergraduate major program in physics is appropriate preparation for graduate study in the fields of physics, astronomy and astrophysics, biophysics, environmental science, geological science and geophysics, medical physics and medicine, patent law, physical science teaching, and oceanography.

Requirements for the Bachelor of Science in Physics

The physics major is required to take the introductory sequence Physics 4, 5, 6, and 7 and a minimum of eight additional physics courses. The usual major program will include Physics 70, 101, 102, 111, 112, 120, 121, 122 and 170. A sequence of mathematics courses, normally consisting of Mathematics 11, 12, 13, 21 and 22, is taken concurrently with the introductory physics sequence. Chemistry 1 and 2 are also required.

Although not required, it is suggested that the physics major consider taking a language course sequence in German, or French. This is useful both from the standpoint of reading the literature of physics and to satisfy the language requirements of graduate schools. It is also suggested that a course be taken in the use of digital computers. Early completion of such a course will facilitate the student's subsequent use of the campus computer facility.

Additional advanced physics and mathematics courses are recommended for those planning to pursue graduate study in physics. Students preparing for careers in

biophysics, medical physics, or medicine should take Chemistry 35, 36 and 37 as well as selected additional courses in biology and chemistry. Students with broad interests crossing into other disciplines may assemble curricula including a strong minor in such fields as biology, electrical engineering and computer science, chemistry, mathematics, or philosophy. Specialized curricula should be developed in consultation with the student's departmental faculty advisor. Additional details concerning specific curricula are available in the publication *Information for Physics Majors.*

Honors Program and Research Participation

Freshman applicants planning to major in physics may also consider separate application for admission to the Honors Program. Among other benefits, honors students are admitted to special honors sections of certain courses offered by the Departments of Economics, English, History, Mathematics, Philosophy, and Religious Studies.

Undergraduate research participation and independent study opportunities are available for physics majors under the direction of physics faculty. Research in the Department is currently funded by NASA and the National Science Foundation. Course credit for undergraduate research participation is available under Physics 90 and 190; course credit is provided for independent study under Physics 99 and 199. These courses are specifically limited to physics majors or honors students with minimum cumulative grade-point averages of 3.00.

1. GENERAL PHYSICS I

The nucleus and radioactivity. Vectors. Newtonian laws of motion. Gravitational force. Linear and angular momenta. Collisions. Work and Energy. Special relativity. Fluid statics. Wave phenomena. Vibrating systems. Sound. Resonance. Doppler effect. Laboratory. Fall term.

2. GENERAL PHYSICS II

Electrostatics. Ohm's law. Electric potential and circuits. Power and Energy. Electromagnetic induction. Alternating voltages and circuits. Electronics. Geometric and physical optics. Quantum phenomena. Energy levels. Semiconductors. Ideal gases and kinetic theory. Temperature. Thermal expansion. Heat transfer. Phase diagram. Laboratory. Prerequisite: 1. Winter term.

3. INTRODUCTION TO ASTRONOMY

Descriptive study of the solar system. Stellar astronomy. The galaxy. The universe. Restricted to students not majoring in physics, chemistry, biology or engineering. Fall term and Winter term.

4. PHYSICS FOR SCIENTISTS AND ENGINEERS I

Measurement. Vectors. Equilibrium conditions. Newton's Laws. Constant acceleration. Particle dynamics. Work and energy. Momentum. Collisions. Rigid-body rotational motion. Simple harmonic motion. Continuum mechanics. Laboratory. Not available for credit to students who have passed 1. Prerequisites: Mathematics 11, 12. (Mathematics 12 may be taken concurrently.) Spring term.

5. PHYSICS FOR SCIENTISTS AND ENGINEERS II
Electrostatics. Gauss' law. Potential. D-C circuits. Magnetic fields. Magnetic induction effects. Dielectric and magnetic materials. A-C circuits. Laboratory. Prerequisites: 4, Mathematics 13. (Mathematics 13 may be taken concurrently.) Fall term.

6. PHYSICS FOR SCIENTISTS AND ENGINEERS III
Waves. Reflection and refraction. Interference and diffraction. Optical instruments. Resonance of waves. Ideal gases. Thermal properties. Thermodynamics. Laboratory. Prerequisite: 5. Winter term.

7. PHYSICS FOR SCIENTISTS AND ENGINEERS IV
Elementary modern physics. Special relativity. Quantum effects. Hydrogen atom. Many-electron atoms. X-rays. Nuclear structure. Nuclear reactions. Molecular and solid-state physics. Laboratory. Prerequisite: 6. Spring term.

50. EARTHQUAKES AND OCEANS
A brief study of the nature, causes and effects of earthquakes; the drift of continents, geo-magnetism, the structure of the ocean floor, isostasy, tidal forces and the role played by these as remote causes of earthquakes.

70. ELECTRONIC CIRCUITS FOR SCIENTISTS I
Linear electric circuits. Phasor analysis, transients and Fourier series. Network theorems. Junction diodes, junction triodes and field effect transistors. Voltage and power amplifiers. Laboratory. Prerequisite: 6. Spring term.

90. UNDERGRADUATE PHYSICS RESEARCH
Departmental work under close professorial direction on research in progress. Permission of the professor directing the research must be secured before registering for this course. Restricted to physics majors and honors students with a 3.00 or better grade-point average.

99. INDEPENDENT STUDY IN PHYSICS
Detailed investigation of some area or topic in physics which is not covered in the regular courses, supervised by a faculty member. Permission of the professor directing the study must be secured before registering for this course. Restricted to physics majors and honors students with a 3.00 or better grade-point average.

101. MECHANICS I: CLASSICAL MECHANICS
Matrices and vectors. Vector calculus. Newtonian mechanics. Gravitational attraction and potential. Oscillatory motion. Nonlinear oscillations. Calculus of variations. Lagrangian and Hamiltonian dynamics. Prerequisite: 4. Fall term.

102. MECHANICS II: CLASSICAL MECHANICS & INTRODUCTION TO QUANTUM MECHANICS

Central force motion. Two-particle collisions. Special relativity. Motion in noninertial reference frames. Particles and waves. Free and bound single particle solutions to Schroedinger's equation. The hydrogen atom. Perturbation theory. Prerequisite: 101. Winter term.

111. ELECTROMAGNETIC THEORY I

Electrostatic fields. Laplace's and Poisson's equations. Dielectrics. Magnetic fields of steady currents. Induced electromotive forces. Magnetic energy. Magnetic materials. Prerequisite: 6. Winter term.

112. ELECTROMAGNETIC THEORY II

Maxwell's equations. Plane waves in free space and in matter. Reflection and refraction. Interference and diffraction. Polarization. Guided waves. Radiation of electromagnetic waves. Prerequisite: 111. Spring term.

113. OPTICS

Geometrical optics. Interference. Fraunhofer and Fresnel diffraction. Optical instruments. Polarization. Crystal optics. Selected topics from contemporary optics. Prerequisite: 6. Winter term. Offered alternate years. Offered 1978.

116. PHYSICS OF SOLIDS

Crystal structure. Free electron theory of metals. Band theory of solids. Magnetism. Superconductivity. Prerequisites: 7, 102. Spring term.

120. THERMAL PHYSICS

The laws of thermodynamics with applications to ideal and non-ideal systems. Elementary kinetic theory of gases. Entropy. Classical and quantum statistical mechanics. Selected topics from magnetism and low temperature physics. Prerequisite: 7. Winter term. Offered alternate years. Not offered 1978.

121. ATOMIC AND NUCLEAR PHYSICS I

Thermal radiation and quantum theory. Distribution functions. Atomic models. Bohr-Sommerfeld atom. Atomic spectra. Degeneracies. Uncertainty principle. Transition rates. Many-electron atoms. Laboratory. Prerequisite: 102. Fall term.

122. ATOMIC AND NUCLEAR PHYSICS II

Magnetic moments. Spin-orbit interaction. Identical particles. Hyperfine structure. X-rays. Nuclear models. Semi-empirical mass equation. Alpha, beta and gamma decay. Nuclear reactions. Nuclear forces. Fundamental particles. Laboratory. Prerequisite: 121. Spring term.

131. METHODS OF MATHEMATICAL PHYSICS I
Matrices and vector spaces. Function space. Fourier analysis and orthonormal sets of function-vectors. Functions of a complex variable. Prerequisite: Mathematics 102. NCX. Fall term.

132. METHODS OF MATHEMATICAL PHYSICS II
Ordinary differential equations. Boundary conditions and eigenfunctions. The Green's function. Prerequisite: 131. NCX. Winter term.

170. ELECTRONIC CIRCUITS FOR SCIENTISTS II
Noise. Feedback and servomechanisms. Operational amplifiers and analog circuits. Oscillators. Transmission lines. Digital circuits. Laboratory. Prerequisite: 70. Fall term.

180. FOUNDATIONS OF QUANTUM MECHANICS
Linear operators and eigenfunctions. Commutation relations and the uncertainty principle. The Schroedinger equation and discrete energy levels. Matrix operators and spin. Dirac notation and operator methods. Prerequisite: Mathematics 102. NCX. Spring term.

190. UNDERGRADUATE PHYSICS RESEARCH
Departmental work under close professional direction on research in progress. Permission of the professor directing the research must be secured before registering for this course. Restricted to physics majors and honors students with a 3.00 or better grade-point average.

199. INDEPENDENT STUDY IN PHYSICS
Detailed investigation of some area or topic in physics which is not covered in the regular courses, supervised by a faculty member. Occasional arrangements are made for students to work in nearby research laboratories or to help teach high school physics. Permission of the professor directing the study must be secured before registering for this course. Restricted to physics majors and honors students with a 3.00 or better grade-point average.

COLLEGE OF SCIENCES
DEPARTMENT OF POLITICAL SCIENCE

William J. Stover, Ph.D. *Chairman*

Professor: Bernard L. Kronick
Associate Professor: Richard Roberts S.J.
Assistant Professors: James P. Gifford, Eric O. Hanson, Karen Hermassi, William J. Stover

Instruction in the Department of Political Science is designed to: 1) offer all students courses planned to introduce the political aspects of society and the analysis of political behavior, institutions and government; 2) concentrate on providing undergraduate majors with a special program of studies leading to the B.S. degree in political science; 3) lay the basis for careers in public service; and 4) prepare students for graduate or professional studies.

In addition to the general requirements of the University and the College of Sciences, the Department of Political Science requires the following:

a) Each Political Science major must complete satisfactorily at least eleven term courses in political science.
b) During the freshman and sophomore years majors are expected to complete four lower division political science courses.
c) During the junior and senior years majors are expected to complete at least seven upper division courses.
d) Of the upper division courses referred to in (c) above, at least one is to be taken in each of these fields: American politics, comparative politics, international relations and political theory.
e) One of the upper division courses must be a senior seminar.
f) The student must maintain an average grade of C in political science courses.

Honors Program

The Honors Program provides well-qualified students with special opportunities for training and research in political science through seminars, tutorials and research projects.

Application for admission to the Honors Program normally should be made in the sophomore year. Applicants must have achieved a 3.30 average or better in all University work, and a 3.50 average or better in political science.

Honors candidates will complete all requirements for a major in political science and will also submit a research project during their senior year. Graduation with Honors in Political Science will require: 1) a 3.30 average or better in all University work; 2) a 3.50 average or better in political science; 3) the submission of an acceptable research project; and 4) completion of such courses as the Honors Committee may designate. Interested students should consult the Chairman.

Special Emphasis Programs

The emphasis programs enable the undergraduate to acquire special expertise and competence without diluting or sacrificing the major. It is an emphasis—not a concentration or specialization—which is to be achieved within the framework of existing departmental and college requirements. The core of these emphases includes both political science courses and courses from other departments. The courses in political science can easily be incorporated into a program satisfying the departmental requirements, while the courses from other departments can be treated as electives.

Emphasis in International Relations

This enables Political Science majors to acquire special competence in the study of international relations, law and organization, economic interdependence, diplomatic history or foreign language and culture. It may include off-campus experiences at a foreign university, a government agency, the United Nations or an international business or financial institution.

Emphasis in Political Economy

The Departments of Political Science and Economics offer jointly a program providing an emphasis in Political Economy. Students wishing to participate will major in either Political Science or Economics but will pursue a special course of study which emphasizes the interdependence of economics and political science in the analysis and solution of current domestic and world economic problems. This program will be especially valuable to students planning graduate work and/or careers in public affairs, law, economics and political science. Full descriptions of the program may be obtained from the Chairman of the Department of Political Science or Economics.

Emphasis in Public Administration

Within the framework of existing college and departmental requirements, emphasis in this program accrues from a core of Political Science courses integrated with suggested courses from other designated departments. This emphasis will assist Political Science majors pursuing careers in public service. It will also serve as a preparation for graduate studies leading to careers in the public, semi-public and private sectors of the business and social economy. Full descriptions of the program may be obtained from the Chairman of the Political Science Department.

Washington Semester Program

This interdisciplinary program enables students to experience governmental operation in Washington, D.C. while continuing to attend regularly scheduled classes at the American University. Areas of study include national government, urban affairs, foreign policy formulation, international economic development, science and technology and economic policy.

I. Introductory Courses*

1. INTRODUCTION TO AMERICAN POLITICS
A survey and analysis of the processes of American government and politics. Topics include principles of the United States Constitution, civil liberties in a democracy, the Presidency, Congress, the Supreme Court, political parties, interest groups, and the principles of the California constitution and government.

2. INTRODUCTION TO COMPARATIVE POLITICS
Government and politics in several modern states. Emphasis upon the development of analytical abilities and critical skills in the evaluation of political culture, behavior, processes, and institutions.

10. PRINCIPLES OF GOVERNMENT
The nature, origin, and justification of the state. Organization, powers and functions of government. The fundamental questions of politics examined in terms of natural law and the common good.

15. INTRODUCTION TO POLITICAL THEORY
An introduction to the major political philosophers and to the principal themes of normative political theory. The enduring issues of politics are studied through these writings and concepts.

25. INTRODUCTION TO INTERNATIONAL RELATIONS
A survey emphasizing conceptual models used to analyze international relations, contemporary problems of world politics, and methods states use to provide peace and security.

25.77. HONORS SEMINAR IN INTERNATIONAL RELATIONS NCX**

40. SOCIAL FORCES IN POLITICS
The impact of social movements on political change. Attention is directed to the goals and means of women and minority movements as well as the political aspects of changing life styles.

90. SELECTED STUDIES IN PUBLIC POLICY
An introduction to the formulation and implementation of selected public policies in comparative nations. Policies include foreign relations, national security and others.

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*From time to time "HONORS" sections may be offered in selected courses. These are designated .77 after the course number.

**Exempt from challenge.

II. Political Theory and Methodology

102. POLITICAL IDEOLOGY
Major approaches to political order in the 19th and 20th centuries, covering a number of political perspectives including liberalism, socialism, communism, conservatism, anarchism and utopian thought.

103. APPROACHES TO THE STUDY OF POLITICS
A study of the theoretical background of political science research. The course examines competing theories, paradigms and types of evidence in the social sciences and presents representative methodologies for political research.

106. POLITICAL CONSERVATISM AND INDUSTRIAL SOCIETY
The forms of conservatism: tempermental, possessive, practical, philosophical. Their bearing upon political conservatism. Major conservative thinkers.

111. HISTORY OF POLITICAL THEORY I—FROM THE GREEKS TO THE RENAISSANCE
The foundations of western political thought in the writings of Plato and Aristotle. The breakdown of classical political thought in the Roman-Hellenistic world and the revival of the classical ideas under the influence of the great theologians such as Augustine and Aquinas.

112. HISTORY OF POLITICAL THEORY II—FROM THE RENAISSANCE THROUGH MARX
The "new science" of politics of the modern age, beginning with the revolutionary ideas of Machiavelli and continuing with a study of the impact of the modern scientific spirit upon the 17th, 18th and 19th century political philosophers through Marx.

113. HISTORY OF POLITICAL THEORY III
Contemporary writers and themes of political thought in the 19th and 20th centuries, including the works of Marx, Freud, Weber and Tocqueville.

117. AMERICAN POLITICAL THEORY
Puritan America to the end of the 19th century. The major issues and themes of American politics reflected in institutions, law and literature.

III. International Relations

125. INTERNATIONAL LAW
An examination of the sources, nature and functions of international law in world politics. Special attention is devoted to the subjects of international law, international transactions and the rules of war. Viewpoints are presented from western, socialist and third world perspectives.

127. COMPARATIVE FOREIGN POLICIES
A comprehensive, comparative study of the foreign policies of selected nation-states. Interaction of international and domestic politics in foreign policy formulation and implementation is examined.

128. AMERICAN FOREIGN POLICY
The aims, formulation and implementation of American foreign policy since World War II, especially toward the Soviet Union, Europe, China and selected less developed countries.

129. SOVIET FOREIGN POLICY
An analysis of Soviet foreign policy within the communist world and the international political system. The course examines the impact of ideology on policy formulation with particular consideration of the Sino-Soviet dispute.

135. FAR EASTERN INTERNATIONAL RELATIONS
International political developments in the Far East from 1900 to the present. Emphasis is on China, Japan, Korea, and Southeast Asia. Included are analyses of the geographic environment, political forces, and the impact of differing cultures on the governmental decision making process.

IV. Comparative Politics

137. POLITICS IN CANADA
A study of Canadian politics with special attention given to federalism, governmental institutions and processes, separatism, urban development and transportation, medical and social care, environmental protection, law and justice.

138. POLITICS IN LATIN AMERICA
An examination of politics and social change in selected Latin American states.

139. POLITICS AND RELIGION IN EAST AND WEST
An inquiry into the relationship between religion and politics in selected cultures. Emphasis is on traditional East Asia, modern Italy, and the contemporary United States.

140. POLITICAL CHANGE IN DEVELOPING NATIONS
A multi-disciplinary study of the problems and politics of political development in Latin America, Africa, and/or Asia. Case studies of the Communist and Capitalist approaches to political development are included as well as the impact of international politics on internal development.

141. POLITICAL LEADERSHIP
The study of political leadership in terms of personality, role, organization, task, values and setting. Explanations of motivation and behavior in political

leadership are sought in elite analysis, belief systems, statecraft, personality theory, charismatic effects, psychobiography and medical histories.

142. BRITISH POLITICS
An analysis of the nature, structure, and utilization of political power in Great Britain. Institutional, cultural, and sociological aspects of politics are treated. Focus on problems of economic and constitutional modernization.

143. POLITICS IN SCANDINAVIA
An examination of the historical background, cultural context, institutional framework and process of politics in Sweden, Norway and Finland.

144. POLITICS IN WESTERN EUROPE
An analysis of the nature, structure, and utilization of political power in representative continental European states. Institutional, ideological, cultural, and psychological aspects of politics are treated. Emphasis upon problems of political stability and social change.

145. SOVIET POLITICS
An analysis of the Soviet political system and its ideological premises. The origin and development of the Soviet party-state and its processes of government and politics.

146. POLITICAL POWER AND SOCIAL GROUPS
"Who owns the country?" "Who runs the country?" "Who gets what, when, and how?" A comparative study of the sources, distribution, and interrelations of economic, political and social power with primary emphasis upon industrialized societies. The idea of an Establishment will be explored. Recent writings about social stratification and its implications for the distribution of wealth will be critically examined.

147. POLITICS IN JAPAN
A study of the political history, institutions, and interest groups of modern Japanese political culture.

148. POLITICS IN CHINA
This course has four main themes: the origins of revolution in modern China, the politics of social and economic modernization in China since 1949, the problems of bureaucratization and political participation, and the succession to Mao Tse-tung.

149. COMPARATIVE POLITICAL SYSTEMS
The comparative study of politics in economically advanced societies. Evaluation of the modes of inquiry into this subject. The relation of political culture to social and economic behavior. Institutions and forms of government.

V. American Politics

150. THE PRESIDENCY
The White House has been the setting for a number of unusual events in the last fifteen years. Obviously the presidency is in a state of flux, and this course analyzes the changing role and powers of the office. Topics also include the president's relations with his staff, the cabinet, the bureaucracy, Congress, the media, and the public.

151. THE CONGRESS
Old men and old ways no longer dominate Congress quite the way they used to. This course is an analysis of the current functions and performance of Congress in the light of historical experience. Topics include the structure of the House and Senate, the operations of the committee system, the role of the leadership, and differing styles of members.

152. PARTIES, PRESSURE GROUPS AND PUBLIC OPINION
One political party is fighting for its life, and the other has lost many of its old supporters. Fewer people vote, and those who do are responding to new influences. This course examines the changing role and characteristics of political parties and interest groups. It also studies public opinion and electoral behavior.

157. CONSTITUTIONAL DEVELOPMENT I
Historical treatment spanning 1607-1890. Topics include English and colonial constitutional heritage; United States Constitution, 1789; landmark cases interpreting the Constitution; nature of the Union; slavery; Civil War; rise of judicial restraints on legislative economic regulation. Prerequisite: 1 or equivalent.

158. CONSTITUTIONAL DEVELOPMENT II
Historical treatment spanning 1890 to present. Topics include heyday and decline of judicial restraints on legislative economic regulation; judicial sanction to extensive national economic regulation; the Constitution in two world wars; the Supreme Court's modern emphasis on civil liberties. Prerequisite: 1 or equivalent.

159. CURRENT CONSTITUTIONAL LAW I
This course treats the present constitutional law of the seven Articles of the original Constitution: organization and powers of Congress, the Presidency, the Courts, interstate relations, the amending process. Instruction in use of legal research sources. Prerequisite: 1 or equivalent.

160. CURRENT CONSTITUTIONAL LAW II
This course treats the present constitutional law of the twenty-six amendments to the Constitution, dealing chiefly with the rights of free speech, free press, freedom of religion, no establishment of religion, criminal justice, vot-

ing rights, due process of law protecting life, liberty, and property, equality before the law. Instruction in use of legal research sources. Prerequisite: 1 or equivalent.

162. URBAN POLITICS

Survey of legal powers, structure, administration of cities. Problems of revenue, law enforcement, public utilities, planning. Equality of opportunity and poverty. Each student does individual field work in selected area of local government.

163. STATE AND METROPOLITAN POLITICS

The development of state constitutions. Federal-state relations. Politics and elections. The legislative process. The courts. County government. The organization and current major problems of state administrative systems.

165. PUBLIC ADMINISTRATION

One of the growth industries in the past decade has been government. Managing billions of dollars and millions of employees is a complicated task, and this course examines the political processes and managerial techniques in the public sector, especially at the federal level. Topics include: budget, personnel, organization, and management processes and the politics of public administration.

166. SPECIAL TOPICS IN PUBLIC ADMINISTRATION

This course will focus on varying public administration topics, often making use of experts outside the university. Possible topics include public sector labor relations, public budgeting and finance, administering county and city government, and public personnel policies.

167. THE MAKING OF PUBLIC POLICY

The processes of government in relation to economic and social programs. An examination of resource allocation, distribution of benefits and burdens, and control. Consideration is given to political choices among alternative policies in energy use, incomes policy, educational resources, health needs and costs, housing and transportation, the means of policy formation, the planning process and administrative programming.

VI. Senior Course Work

180.01, 180.02 INDEPENDENT STUDY

For students who wish to do intensive reading in areas not emphasized by the Department or to do further independent study on specific topics not fully covered in upper division courses. Written outlines of the proposed topics and previous consent of instructor are required.

183. SEMINAR IN COMPARATIVE POLITICS
Consideration of selected topics in comparative politics in various states and regions.

184. SEMINAR IN AMERICAN POLITICS
An examination of topics and problems in the American political process.

191. SEMINAR IN POLITICAL THEORY
Aspects of 20th Century political thought. A comparison of the values represented by the "Establishment" and those of the "Counter Culture." Is the Counter Culture a viable political movement? What is its precise nature? Do the sub-cultures of drugs and sexuality intimate anything beyond them as harbingers of a new and "good society"? What seems to be the place of the Counter Culture in the history of political thought?

193. SEMINAR IN WORLD REVOLUTIONARY FORCES
Theories of revolution which deal with the psychological, social and political aspects of change. Case studies of revolutionary movements and societies.

196. SEMINAR IN INTERNATIONAL RELATIONS
A consideration of selected aspects of international political behavior.

197. SEMINAR IN CIVIL LIBERTIES
Open to political science majors, and others by permission of the instructor.

199.01, 199.02, 199.03. PRACTICUM IN PUBLIC AFFAIRS
Students work for government agencies, legislative bodies, or politically related groups and have the opportunity to test and apply firsthand some of the ideas and techniques of political science. May be taken as the equivalent of one, two, or three courses and may be concentrated in one quarter or spread over three. Open to qualified juniors and seniors who need not be political science majors. Contact Professor Gifford for further information and for permission to take the course.

COLLEGE OF SCIENCES
DEPARTMENT OF PSYCHOLOGY

Roland C. Lowe, Ph.D., *Chairman*

Associate Professors: Marvin L. Schroth, Eleanor W. Willemsen
Assistant Professors: Roland C. Lowe, Robert Numan,
James P. Otteson, Elizabeth D. Tanke

Students majoring in Psychology, in addition to fulfilling the general requirements for a Bachelor of Science degree, must successfully complete the following courses: Mathematics 6 and 7, Biology 7 and 8, Psychology 10, 11, 95, and eight additional upper division electives, to be selected with advisor.

Students who plan to go into related fields such as special education, primary or secondary teaching should select with their advisors a group of courses in Psychology and Education specifically geared to their objectives.

Students planning graduate work towards the Ph.D. in Psychology should take Psychology 110 and 130 and courses relevant to their individual goals in Physics, Chemistry and Computer Science.

Honors Program

The department of Psychology provides a special program designed to meet the needs of those students showing exceptional scholastic promise and likelihood of continuing on to psychology graduate school.

The Honors student will become involved in the following special programs:

1. Special seminars in the department.
2. Ongoing research being conducted by staff members and psychology majors.
3. An independent piece of research in the senior year.
4. Attendance in courses in other departments selected to broaden the student's background.

1. GENERAL PSYCHOLOGY
Introduction to the scientific study of behavior. Topics covered include perception, motivation, intelligence and abnormal behavior. Primarily for non-majors.

5.77. HONORS COLLOQUIUM
Restricted to Honors Program students. Major issues in Psychology.

10. PSYCHOLOGY AS A NATURAL SCIENCE
The scientific study of human and animal behavior in terms of sensation, perception, learning, motivation, and emotion. Emphasis also placed on the

physiological bases of behavior. Introduction to research methodology and statistical analysis of data.

11. PSYCHOLOGY AS A SOCIAL SCIENCE
Principles of human development, intelligence, abilities, personality. Psychological measurement. Sociopsychological influences on behavior. Further exposure to research methodology and additional statistical techniques.

50. PSYCHOLOGY OF ADJUSTMENT
An introduction to the psychology of personal and social adjustment. Personality patterns of the individual in various contexts, such as family, the school, marriage, the adolescent years, social relations.

70. COMPARATIVE ANIMAL BEHAVIOR
Study of animal behavior from a naturalistic and empirical viewpoint. Through a survey of the literature dealing with classical ethology and american comparative psychology the course will stress the interaction between instinct (genetically determined fixed behavior patterns) and experience (learning) as determinants of animal behavior. Topics of interest will include filial behavior, animal communication and social behavior, aggression and emotional behavior, sexual behavior and the evolution of behavior. Prerequisite: Psy 10.

80. CHILD PSYCHOLOGY
This course will survey development from birth to puberty. It is intended primarily for those who will not be taking the Psychology 181, 182, 183 sequence. Primarily for non-majors. Prerequisite: Psychology 010 or 011 recommended.

95. STATISTICAL AND EXPERIMENTAL DESIGN I
Statistical theory, methods, and principles underlying psychological experimentation and measurement. Indices of location and variability, sampling theory and statistical inference. Correlational theory. Prerequisites: 10, 11.

105. STATISTICS AND EXPERIMENTAL DESIGN II
Advanced topics in theory and methods of statistical analysis and experimental design. Topics include complex analysis of variance, multiple correlation and regression, factor analysis, and an introduction to nonparametric statistics. Prerequisite: 95.

110. EXPERIMENTAL PSYCHOLOGY
A survey of the experimental literature in learning, motivation, sensation and perception, and social behavior. Application of experimental design and statistics. Lectures and laboratory. Prerequisite: 95.

112. MOTIVATION AND EMOTIONS
The scientific study of the various motivational-emotional processes of man and higher animals. How motives and emotions initiate or direct behavior.

115. INTRODUCTION TO ABNORMAL PSYCHOLOGY
A comprehensive treatment of the major forms of mental disorder with regard to their etiology, nature, development, and therapy. Current theories of mental disease. The psychology of abnormal thinking. Prerequisite: 10 or 11.

120. CLINICAL PSYCHOLOGY
Methods of clinical psychology including various psychotherapies, diagnostic testing, and consultation will be covered. Prerequisite: Abnoraml Psychology or Personality.

130. PSYCHOLOGY OF LEARNING AND THOUGHT PROCESSES
A survey of the experimental literature on the basic forms of the learning process from animals to mankind. Included are the latest theories on memory and thought processes.

135. DEVELOPMENTAL PSYCHOLOGY SEMINAR
This course will be a small enrollment discussion class for Psychology Majors. Students will pursue readings from the original theoretical and empirical journal literature on some topic area from Developmental Psychology. The topic will vary from year to year. All students will prepare research proposals as term projects. Prerequisite: Either Psychology 185, 186, or 187.

136. PSYCHOLOGY OF SEX DIFFERENCES
This course will deal with culturally defined sex roles and sex differences in personality, cognition, and biology. The processes by which sex differences develop will be discussed. The social-learning, cognitive-developmental, and psycholoanalytic views will all be treated. Writings from the current movement for a change in traditional sex roles will be read and students will be encouraged to examine the relation between course materials and their own lives.

138. THE EXCEPTIONAL CHILD
This course will survey the problems of mental retardation and (so called) mental illness in children. The course will survey various kinds of problems and the means of aiding the children involved by means of psychotherapy and/or special education. The special problems of the gifted child will also be discussed. Prerequisite: One of Psychology 185, 186, 187 and 80.

140. RESEARCH IN CHILD PSYCHOLOGY
Application of research methodologies to study of child development. Individual research projects required. Prerequisite: 95 and 110.

145. PSYCHOLOGICAL MEASUREMENT

Principles and problems of measurement in psychology, especially as related to tests of attitudes, aptitudes and personality. Students construct, administer, score, interpret, and evaluate tests.

150. SOCIAL PSYCHOLOGY

Study of the influence of social environment on psychological processes and behavior. Topics covered include, for example, person perception, social comparison processes, attitude change, aggression, behavior in small groups.

155. ENVIRONMENTAL PSYCHOLOGY

The study of human behavior as it is influenced by natural and man-made environments. A primary goal of this course is to integrate a variety of related approaches: psychology, anthropoligy, architecture, sociology, urban design. Naturalistic field study will be considered as an alternative to experimental laboratory research. Students are required to do a project that deals with one of the topics that is covered in the course: personal space, field experimentation, naturalistic observation, influences of the physical environment, social perception, territoriality, crowding, problems in architectural and urban planning. The course is restricted to advanced Psychology majors.

160. THEORIES OF PERSONALITY

Critical analysis of major theories of personality with emphasis on practical and research implications. NCX*

165. PHYSIOLOGICAL PSYCHOLOGY

Neural basis of behavior. Emphasis on the neuroanatomical, neurochemical and neurophysiological correlates of motivation, emotion, learning and memory. Other topics include the neural regulation of sleep and arousal, mechanisms of drug action and neuropathology. Laboratory will include a study of brain anatomy, and the application of physiological techniques to the study of animal behavior. Lectures and Laboratory. Prerequisites: Psy 10, 95; Bio 8; or permission of instructor.

166. ADVANCED TOPICS IN NEUROPSYCHOLOGY

An in-depth coverage of special interest areas relating brain mechanisms and behavior. The aim of this offering is to give intensive coverage to a single advanced topic in neuropsychology. Possible topics include: neuroanatomy and neurochemistry, psychopharmacology, hormones and behavior, biofeedback, neural basis of aging and neuropathology. Prerequisite: Psy 165.

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*Exempted from challenge.

170. SYSTEMS, THEORIES, AND MODELS IN PSYCHOLOGY
Origin and development of modern psychology. Structuralism, Functionalism, Behaviorism, Gestalt Psychology in terms of sensation, perception, learning, thinking, etc. Miniature systems and models. NCX*

175. HUMANISTIC PSYCHOLOGY
A survey of the literature from the humanistic "third force" in psychology. Rogers, Maslow, May, Berne and Perls are studied from both theoretical and therapeutic standpoints. Traditional psychology is also examined in the light of these writings. Stress is placed upon the motifs of self-actualization, individuality and values as these pertain to the conduct of psychology.

182. SEMINAR IN THE PSYCHOLOGY OF MOTIVATION
A series of assigned readings and reports from classic and contemporary sources in the experimental and theoretical literature on motivation. Investigation of special problems. NCX*

184. SEMINAR IN THE PSYCHOLOGY OF LEARNING
A series of assigned readings and reports from classic and contemporary sources in the experimental and theoretical literature on learning and thinking. NCX*

185. DEVELOPMENTAL PSYCHOLOGY I
This is the first course in a sequence of courses which will explore the development of individuals over the course of the life cycle. Topics for the year course will include (1) principles and theories of development, (2) perceptual, cognitive, social and personality development, (3) family, school and other societal influences on development and (4) applied issues in child rearing, education, and other socialization practices. Students will have an opportunity to clarify their values about having and raising children and about the responsibilities of society generally to children. The course is organized on an age-stage basis. This first course usually covers developmental principles, prenatal development, infancy and the toddler period.

186. DEVELOPMENTAL PSYCHOLOGY II
This is a continuation of the sequence beginning with Psychology 185. This quarter usually covers the early and middle childhood years, i.e. approximately ages 4 through 11. Intelligence, schools, sex roles, achievement, and prejudice are topics of special attention.

187. DEVELOPMENTAL PSYCHOLOGY III
This is a continuation of the sequence beginning with Psychology 185. This quarter usually covers the age period from puberty through the early twenties. The establishment of personal identity and the development of sexual expression are central themes in this quarter. Attention is also given to intellectual development, high school education, and moral development.

188. DEVELOPMENTAL PSYCHOLOGY IV

This course is given every other year. This course will cover adult development including young adulthood, middle age, retirement aging and death. Topics will include family roles, occupational development, establishment and change of life style, sex roles, and the development of values and attitudes. We will consider theoretical issues related to stability vs. change in personality over the life span.

190, 191, 192. INDEPENDENT RESEARCH

Independent projects may be undertaken by upper-division students with a faculty sponsor. To be eligible to receive a course credit for such research the student must submit a formal written proposal and have it approved by the sponsoring faculty member and the department chairman. The proposal must be submitted before the end of the previous quarter and it must specify the purpose of the research, the nature of the work to be accomplished and a time schedule for the completion of the work.

195. ADVANCED SEMINAR

Intensive focus on selected topics which vary from year to year.

197, 198, 199. PRACTICUM

Clinical experience in community agencies. Involves selected readings. Open to seniors with average GPA of 3.00 or better. Present practicums include child development, psychotherapy with children, and occupational therapy.

COLLEGE OF SCIENCES
DEPARTMENT OF
SOCIOLOGY/ANTHROPOLOGY

Witold Krassowski, Ph.D., *Chairman*

Professor: Witold Krassowski
Associate Professor: Paul F. Verden
Assistant Professors: Linda E. Cool, Kichiro K. Iwamoto, Joan Kruse, Nancy Olsen, Allan G. Pastron

Sociology and Anthropology are closely related disciplines; both study the social life of human groups. While the general approach of the Department emphasizes the scientific and analytic aspects of the two fields, students will find that Sociology and Anthropology are also avenues to the development of personal values on issues of social concern.

All students in the Department major in Sociology/Anthropology, but are expected to emphasize one or the other of the two disciplines.

Students who wish to make Anthropology their area of emphasis, in addition to fulfilling the general requirements of the University, and the College of Sciences, must complete the following courses: Anthropology 1, 2, and 3; Sociology 1, 17, and 19; Anthropology 118, and a minimum of seven other upper-division courses in the Department. Of these seven, at least five must be in Anthropology; the others may be in either Anthropology or Sociology.

Students who wish to emphasize Sociology, in addition to fulfilling the general requirements of the University and the College of Sciences, must complete the following courses: Sociology 1, 13, 17 and 19; Anthropology 3; Sociology 118 and a minimum of seven other upper-division courses in the department. Of these seven, at least five must be in Sociology; the others may be in either Sociology or Anthropology.

An average grade of C must be maintained in the courses in the major.

The academic programs developed by the department stress the individual interests and objectives of students. Attempts are made to develop personalized programs for each student which makes it essential that students majoring in the department frequently consult—and work closely with—their academic advisors. A variety of options are open to students majoring in Sociology/Anthropology such as: a) pre-professional programs designed for the student who plans to do advanced graduate work in the discipline, b) a pre-legal option for the student who chooses to enter law school, c) an undergraduate program for the student who plans to do graduate work leading to teaching credentials in elementary, secondary, and special education, d) a concentration preparatory to graduate work in the field of Administration (MBA) or Social Welfare (MSW), etc. Students who view their Bachelor Degree as a terminal one find that Sociology/Anthropology offers a strong background for careers in social service, juvenile and adult probation, child welfare, urban planning and for various types of positions in organization management. Suggested courses of study for each of these career options are described in the pamphlet, "Majoring in Sociology/

Anthropology," available from the Chairman of the Department or the student's academic advisor.

Honors Program

Outstanding students in Sociology/Anthropology are invited to participate in the University Honors Program. This four-year program will provide students with particularly challenging and stimulating learning experiences corresponding to their academic potential.

In addition to the University Honors Program, qualified juniors and seniors (3.5 GPA in Sociology/Anthropology and 3.0 GPA overall) are invited to participate in the Departmental Honors Program.

Honors students in Sociology/Anthropology will be expected to: 1) enroll in honors seminars, and special honors sections of regular courses; 2) become involved in research, both through participating in on-going faculty research projects, and through initiating and executing, under faculty guidance, small-scale research projects of their own; and 3) complete a senior thesis based upon independent research. Interested students should consult the Chairman at the earliest opportunity.

SOCIOLOGY

1. PRINCIPLES OF SOCIOLOGY
An introduction to the field of sociology with applications of sociological principles to our present society.

1.77. HONORS SEMINAR IN PRINCIPLES OF SOCIOLOGY NCX*

13. AMERICAN SOCIETY
A mutual exploration of the potential and limitations of the sociological perspective for enhancing personal liberation within the constraints of an advanced industrial civilization. Includes a review of the social problems besetting contemporary American society, their inter-relations and structure bases within American society.

17. PRINCIPLES OF DESCRIPTIVE STATISTICS
Introduction to statistical analysis. Single- and multi-variate description, measures of association, and logic of statistical inference. Focus is on the application and uses of these techniques in the field of sociology. Prerequisites: Mathematics 6 or equivalent.

19. RESEARCH METHODS
Introduction to basic research methods, including participant observation, content analysis, survey research, and laboratory experiments. Each technique is used to gather and analyze data. Prerequisite: Sociology 17. NCX*

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*Exempted from challenge.

27. STATISTICAL ANALYSIS
Advanced topics in the application of statistical and mathematical techniques to research data. Topics include statistical inference, research design, scaling techniques, and current techniques used in social research. Prerequisites: Sociology 17 and 19. NCX*

90, 91, 92. LOWER DIVISION SEMINAR IN SOCIOLOGY
Seminars for freshmen and sophomores on selected issues in sociology or current problems of social relevance. By permission of the instructor only. NCX*

99. PRACTICUM FOR LOWER-DIVISION STUDENTS

110. INTERGROUP RELATIONS
Prejudice and discrimination toward minorities, with particular emphasis upon the current situation in the United States.

112. ASIAN-AMERICAN COMMUNITIES
Historical development and contemporary social organization of Asian communities in the United States; Asians as a racial minority in American society; personality development and mental health of Asian-Americans.

117. ADVANCED RESEARCH METHODS
The formulation and design of applied research. Definition of the problem, hypothesis testing, development of research design, measurement, data gathering, computer analysis and interpretation of findings. Prerequisites: Sociology 17 and 19 with a grade of B or better, or permission of the instructor. NCX*

118. INTRODUCTION TO SOCIOLOGICAL THEORY
A course focusing on the principal social theories, questions they are trying to answer, and their relations to methodological principles. Prerequisite: Sociology 1, Sociology 19 or permission of the instructor.

119. POLITICAL SOCIOLOGY
Conflict, consensus, coercion and authority. The study of the relationship between the social structure and the political order. The social bases of political parties, political movements and the state.

120. COLLECTIVE BEHAVIOR
Analytical study of collective behavior principles; typology of crowds, mass behavior and the characteristics of publics. Introduction to social movements.

129. THE PROCESS OF COMMUNICATION
Communication as a sociopsychological and cultural process. Communication patterns in small groups, and in large organizations. Organization, functions, and development in mass media. Comparisons of systems.

132. SOCIAL STRATIFICATION
Examination of the basic characteristics of social rewards in society and how they contribute to social structures of inequality. Focus upon social class life styles and consequences for members.

143. URBAN SOCIOLOGY
Urbanization, its nature, causes, and consequences. Growth and structure of metropolitan areas. Decision-making in cities. New patterns of urban government. NCX*

144, 145. URBAN ISSUES I & II
Analysis of social, political, and economic structures of modern city. Impact of state and federal programs. Community planning and development. NCX*

147. INDUSTRIAL SOCIOLOGY
Examination of the characteristics of modern industrial society and some of its basic problems, such as alienation, affluence and the work ethic, industrial motivation models, modern sex roles, primary group influences, and leadership behavior.

148. HUMAN BEHAVIOR IN COMPLEX ORGANIZATIONS
Examination of bureaucracy, the fundamental social organization of modern society. Focus will be upon the characteristics and consequences of living in a bureaucratic society. Examples drawn from industrial organizations, mental institutions, prisons, and universities.

149. WORK AND LEISURE
An exploration of the past, present, and future of work and leisure in human history. The apparent complimentary nature of work and leisure will be examined in terms of cultural context, selected social institutions, systems of stratification, technology, social role and self concepts. Course materials will include a consideration of the changing meaning of such terms as time, wealth, alienation, and sloth.

150. SOCIAL PSYCHOLOGY
The study of individuals in social contexts. Topics include person perception, social influence, persuasion, interpersonal attraction, power, status and norm formation, and conformity.

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*Exempted from challenge.

151. SOCIOLOGY OF SEX ROLES
A sociological analysis of sex differences and sex-role inequalities including an examination of cross-cultural, historical, and contemporary U.S. materials.

152. SOCIALIZATION
The learning of norms and values throughout the life cycle, with an emphasis on the social structures within which socialization occurs.

153. CHILDHOOD AND SOCIETY
Childhood in various cultures and in historical perspective. Social definitions of childhood in the U.S., and their reflection in legal, educational, and family institutions.

156. FAMILY AND KINSHIP
Marriage, the family, and kinship are studied both in our own society and in cross-cultural perspective.

157. SELECTED ISSUES IN FAMILY AND KINSHIP
An intensive study of one or two topics in the field of family and kinship. Prerequisite: Sociology 156 or consent of the instructor.

159. SOCIOLOGY OF EDUCATION
The socio-psychological aspects of educational processes and educational institutions in a changing society.

161. SMALL GROUPS
The structure and social processes that occur in small groups. Topics include power and prestige, leadership, communication networks, game theory, and distributive justice.

165. DEVIANT BEHAVIOR
Examination of such deviant behavior as crime, mental disorder, and alcoholism. Social factors in the etiology and control of deviant behavior.

166. CRIMINOLOGY
The study of crime in society. The course will include a review of "classical" theories of criminal activity, as well as contemporary viewpoints. "Crime" will be considered in relation to American society, its institutions and ideologies. Criminal perspectives and "victimology" will also be included.

169. POPULAR CULTURE
A socio-historical analysis of shifting current and significant trends in the development of popular mass culture activities in America from 1900. Special emphasis will be given to the continued presence of folk and ethnic art forms (including music, dance and humor) and the emergence of a mass entertainment industry.

170. SOCIAL CHANGE
Significant trends and issues in contemporary American society and in the world. The utility of sociological concepts and principles in understanding contemporary society.

171. DEMOGRAPHY
The demographic issues of the modern world; patterns of population growth, problems of quantity, composition, distribution, and quality, and population policies.

172. SOCIOLOGY OF AGING
Introduction to social gerontology. Theoretical approaches and research in social gerontology. The aged: living environments, public attitudes, self-image, public policies and programs, death and dying.

180, 181, 182. UPPER-DIVISION COLLOQUIUM IN SOCIOLOGY
Colloquia for upper-division students on selected issues in Sociology.

189. JUNIOR SEMINAR IN SOCIOLOGY
Advanced seminar in sociological methodology culminating in the students' design and execution of an original, independent research project. Required for juniors majoring in sociology. NCX

190. SENIOR SEMINAR
A seminar required for all seniors who major in the department. NCX.

193, 194, 195. ADVANCED SEMINAR IN SOCIOLOGY
Seminars for juniors and seniors on selected issues in sociology or current problems of social relevance. One offered each term. By permission of the instructor only. NCX*

196. INDEPENDENT RESEARCH
Involves student participation in an on-going research project or the development and execution of a student research project under the supervision of a faculty member. By permission of the instructor only. NCX*

197. INDEPENDENT STUDY
For students who wish to do intensive reading in areas not emphasized by the Department, or to do further independent study on specific topics not fully covered in departmental courses. By permission of the instructor only. NCX*

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*Exempted from challenge.

198. TEACHING INTERNSHIP

An opportunity for qualified students to assist in teaching selected courses in the Department, ordinarily by leading discussion or lab sections. They will work under the close direction of the faculty member in charge of the course. By invitation only. NCX*

199, 199A, 199B. PRACTICUM

Opportunity for students in good standing to work and conduct sociological analysis in community agencies, government bureaus and political or industrial organizations. May be taken on a part-time basis as a one or two term course equivalent or on a full-time basis as a three-term course. By permission of the instructor only. NCX*

ANTHROPOLOGY

1. INTRODUCTION TO PHYSICAL ANTHROPOLOGY

The study of the origin and antiquity of man, the fossil evidence for human evolution, primate behavior, and human variation in morphology, serology, and genetics.

2. ARCHAEOLOGY AND PREHISTORY

A survey of the evolution of human culture during the pleistocene period in both the Old World and the New World.

3. INTRODUCTION TO SOCIAL AND CULTURAL ANTHROPOLOGY

The concept of culture, the development and evolution of social and cultural analysis of the major sub-systems of culture (economic, echnological, social and political organizations, philosophy and world-view), and selected issues of social concern: racism, cultural determinism, cultural relativity.

3.77. INTRODUCTION TO SOCIAL AND CULTURAL ANTHROPOLOGY, HONORS NCX*

90, 91, 92. LOWER DIVISION SEMINAR IN ANTHROPOLOGY

Seminar for freshmen and sophomores on selected issues in social and cultural anthropology. By permission of the instructor only. NCX*

118. ANTHROPOLOGICAL THEORY

A survey of the major schools of thought in the development of social and cultural anthropology, ranging from 19th century cultural evolutionism to contemporary French structuralism, and a discussion of field methods.

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*Exempted from challenge.

142. SOCIAL ORGANIZATION
The analysis of kinship, marriage and descent structures, their evolution and range of variation in world cultures.

144. CULTURAL ECOLOGY
Survey of the theories, methods and applications of the ecological perspective to the cultural attributes of human populations; emphasis of the course will be upon the relationship between the natural environment and human cultural systems.

148. OLD WORLD PREHISTORY
A survey of the prehistoric cultures of Africa, Europe, and Asia during the pleistocene period.

150. ANTHROPOLOGICAL APPROACHES TO THE STUDY OF RELIGION
A comparison of approaches taken by anthropologists and other social scientists to understand the nature of religious beliefs in different cultures. Relation of myth and ritual to social organization, environment, and other systems of thought.

152. POLITICAL ANTHROPOLOGY
Problems of defining and studying political behavior in non-Western cultures. Effects of social, cultural and environmental factors on political organization in selected societies. Emphasis upon comparison of analytical assumptions of different authors.

155. PSYCHOLOGICAL ANTHROPOLOGY
The inter-relationships among cultural, social, and psychological factors in human behavior. Prerequisites: one course in Anthropology and one course in Psychology.

158. ANTHROPOLOGY OF DEVELOPMENT
The effects of change on people's lives in third world countries. Cultural and social change will be examined in concrete instances studied by anthropologists. Included are theories of change and the relevance of applied anthropology.

172. ANTHROPOLOGY OF AGING
Cross-cultural examination of the aging process in a range of human societies. Emphasis on level of technology, degree of urbanization, rate of social change as well as social, political and cultural differences in understanding how old people adapt to, and cope with, the modern world.

184. ANTHROPOLOGY OF MEDITERRANEAN EUROPE
Examination of the similarity and diversity of the cultures of Mediterranean Europe. Emphasis on modes of social relationships such as patronage and on cultural factors such as the concepts of honor and shame. Economic de-

velopment and change in rural communities and the urbanization of migrants.

185. PEOPLES AND CULTURES OF MEXICO
A survey of both prehistoric and contemporary societies of Mesoamerica; the course will emphasize the relationship between ancient and modern Mexican cultural systems.

186. NORTH AMERICAN INDIAN ETHNOGRAPHY
The range of variation of North American Indian cultures from the Arctic to Mexico; the concept of culture area; modern reservation conditions.

187. PEOPLES AND CULTURES OF AFRICA
A general anthropological view of the major institutions of sub-Sahara Africa, as exemplified through their appearance in a wide variety of cultures. Both ethnographic accounts and theoretical issues are discussed.

189. JUNIOR SEMINAR IN ANTHROPOLOGY
Advanced seminar in anthropological methodology culminating in the students' design and execution of an original, independent research project. Required for juniors majoring in anthropology. NCX.

190. SENIOR SEMINAR
A seminar required for all seniors who major in the department. NCX.

193, 194, 195. ADVANCED SEMINAR IN ANTHROPOLOGY
Seminars for juniors and seniors on selected topics in social and cultural anthropology. By permission of the instructor only. NCX*

196. INDEPENDENT RESEARCH
Involves student participation in an on-going research project, or the development and execution of a student research project under the supervision of a faculty member. By permission of the instructor only. NCX*

197. INDEPENDENT STUDY
For students who wish to do intensive reading in areas not emphasized by the Department, or to do further independent study on specific topics not fully covered in departmental courses. By permission of the instructor only. NCX*

198. ADVANCED LABORATORY IN ARCHEOLOGICAL METHOD
Original research, analysis and interpretation of archeological material that has been collected in the field. Students will gain a basic knowledge of os-

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*Exempted from challenge.

teology and lithic technology and, when possible, participate in brief projects of on-site field research. By permission of the instructor only. NCX*

199, 199A. FIELD COURSE IN ARCHEOLOGICAL METHOD

Six weeks of on-site archeological field research. Students will learn through practical experience the basic techniques of excavation and field analyses. By permission of the instructor only. NCX*

SCHOOL OF BUSINESS AND ADMINISTRATION

Charles J. Dirksen, M.S.C., LL.D., *Dean*

The Board of Trustees established the School of Business and Administration as an integral part of the University of Santa Clara in 1926. The four-year curriculum was approved in 1927. The Graduate School of Business and Administration was established in 1958.

The School of Business and Administration correlates the general education aims of the University with preparation in meeting the general and specific problems of industry.

The specific aims are to supply professional training for those who are aiming at responsible positions in corporations, in their own businesses, in professional organizations serving business, or in state and federal government agencies; and to provide graduate work at both the master and doctoral levels.

The Schools of Business and Administration is divided into three divisions:

Undergraduate, leading to the B.S.C. degree;
Graduate, leading to the M.B.A. and Ph.D. degree;
The Center for Leadership Development.

There are six departments within the School—Accounting, Economics, Finance, Management, Marketing and Quantitative.

National Affiliation

Both the Graduate and the Undergraduate Schools are accredited by the American Assembly of Collegiate Schools of Business.

Rights Reserved

The curriculum and regulations affecting students may be revised at any time at the discretion of the University administration.

Undergraduate Program

The program leading to a degree of Bachelor of Science in Commerce consists of a total of 175 quarter units. Thirty-five quarter units taken in the last three regular terms of attendance at the University shall constitute residence requirements for a degree.

During the first two years, extreme specialization is not the aim of the School. Rather, the student is trained in the fundamentals of English, Mathematics, Economics, Accounting, and Humanities so that he will be well prepared to analyze and study the technical and special problems of business.

During the Junior and Senior years, the program is arranged so that every student will include courses in the major functions found in typical business firms. All students must take courses in Finance, Marketing, Management, Accounting and Quantitative Methods.

Special and advanced work is given in Accounting, Management, Economics, Finance, Marketing and Statistics so that students may specialize in some specific area. As an example, majors in Accounting may take the required work to prepare for the Certified Public Accounting examination.

General educational courses provide the student with the broader fundamental principles necessary for dealing with the industrial system in its social and technical relationships.

Honors Program

The School of Business participates in the Honors Program of the University. During the Freshman and Sophomore years, students are assigned to honors sections which will be offered for students in the School of Business and in the Colleges of Humanities and Science. During the Junior and Senior years, special honors sections will be supervised by the various departments in the School of Business.

Internship Program

The Undergraduate Committee of the School of Business and Administration will grant permission for a limited number of students to earn five quarter units of credit in a special internship program.

To qualify for the course credit, the student will be required to make arrangements with an executive of a business firm or governmental unit to supervise the work or project.

The student must then submit a written petition to the Undergraduate Committee. The petition must include a detailed plan of study and a written statement from the executive of the organization stating that he will accept the responsibility of supervising the work or project.

The Undergraduate Committee of the School will decide whether or not the petition for the work will be approved.

Method of Instruction

Students learn through participation. Cases, problems, and discussions supplement in large measure the lecture method which many schools use.

The students serve as active participants in class discussions. They learn to analyze business problems in a great variety of situations. In so doing, they develop the ability and aptitude to evaluate a business problem and choose a course of action.

Transfer Students

Students who transfer to the School of Business from other universities and junior colleges must complete, during their first two years, a minimum of 60 semester or 90 quarter units in order to be given Junior status. Included in these units must be 6 semester or 9 quarter units of Principles of Accounting, 6 semester or 9 quarter units of Principles of Economics, and six semester or 9 quarter units of Mathematics.

Graduation Requirements

The program leading to a degree of Bachelor of Science in Commerce consists of a total of 175 quarter units. During the first two years in the School the student

must complete 88 quarter units. The recommended program for the first two years is similar for all students. Included in these units are the following specific course requirements.

LOWER DIVISION

1. English—3 Courses
   English 1, 2 and 3.
   (Any Literature Course may be substituted for English 3.)
2. Mathematics—3 Courses
   (Students with inadequate preparation in Math must complete Quantitative Methods 14, or Math 1, before selecting one of the following sequences.)
   Quantitative Methods 15, 16 and one computer course or Mathematics 11, 12 and one computer course.
3. Humanities and Social Sciences—5 Courses
   At least 3 courses must be taken in Humanities. No more than two courses may be taken from one department. An advanced writing course and one philosophy course are recommended. Economics courses do not fulfill this requirement, except American Economic History (13.012.)
4. Accounting—3 Courses
   Accounting 1, 2, 3
5. Economics—2 Courses
   Economics 1 and 2
6. Statistics—1 Course
   Quantitative Methods 40 or Economics 55
7. Religious Studies—2 Courses
8. Electives 3 to 5 Courses
   (Business and Society (73.011), and one law course are recommended.)

UPPER DIVISION

Freshman and Sophomore students will not be allowed to take Upper Division Courses until they have completed a minimum of 75 quarter units. Included in the 75 quarter units must be Accounting 1, 2, and 3; Economics 1 and 2, and Statistics Q.M. 40. Students must fulfill prerequisites before they are permitted to take Upper Division courses.

Each student is required on entering the Upper Division to fulfill the following minimum requirements for graduation:

1. At least 87 Quarter Units, (13 of the courses numbered 100 and above) must be completed after fulfilling the requirements of the lower division.
2. A minimum of 12 Upper Division Courses (60 quarter units) in Business and Economics must be completed during the Junior and Senior years. Of these 12 courses, the following core is required of all students:
   Quantitative Methods 100
   Finance 121
   Management 160

Marketing 181
Economics 114
Management 162 or Economics 115

3. Religious Studies—1 Course
4. Electives—5 Courses

   Any course given at the University will satisfy this category. However, the student should be careful to select these courses so as to achieve the 175 quarter units requirement.

In addition to the core requirements a student should select a field of emphasis. The following fields of emphasis are approved:

Accounting, Quantitative Methods, Economics, Finance, Management and Marketing.

A student, who, for important reasons, does not wish to select one of the areas of emphasis, may on written petition to the Undergraduate Committee receive permission to follow a general business program.

Written Petitions

The School of Business Undergraduate Committee has a very strict requirement that must be followed by all students. All requests for changes in program *must* be on *written petition* to the Undergraduate Committee. Petition Forms may be secured in the School of Business Office, 3rd Floor, Kenna Hall, the School of Business Building.

SCHOOL OF BUSINESS AND ADMINISTRATION
DEPARTMENT OF ACCOUNTING

Charles F. Louie, Ph.D., *Chairman*

Professors: Thomas Maier, John Pagani (Emeritus), Charles F. Louie
Associate Professor: Marlynn K. Bohman
Assistant Professors: Paul V. Harrell, Paul L. Locatelli, S.J.
Acting Assistant Professors: Robert Bowen, Charles Huber
Lecturer: Kenneth Wade

Required: 130, 131, 132, plus any two other accounting courses. Those preparing for professional accounting careers should include 133, 135, 136, 137, 138, Business Law 18 and 175.

1. FUNDAMENTALS OF ACCOUNTING
Constructive aspects of accounting with attention centered on the general ledger and its manipulation.

2. FUNDAMENTALS OF ACCOUNTING
The financial cycle and its interpretation as seen through accounts. Prerequisite: 1.

3. FUNDAMENTALS OF ACCOUNTING
Managerial accounting as viewed through the analysis of costs. Prerequisite: 2.

55. ACCOUNTING IN THE SOCIAL SCIENCES
The Analytical framework of accounting with reference to the social sciences.

130. INTERMEDIATE ACCOUNTING I
Valuation in financial accounting. Prerequisite: 2.

131. INTERMEDIATE ACCOUNTING II
Valuation in financial accounting. Prerequisite: 130.

132. ADVANCED ACCOUNTING I
Accounting for proprietary interests. Prerequisite: 131.

133. ADVANCED ACCOUNTING II
Accounting for proprietary interests. Prerequisite: 132.

134. ACCOUNTING AND INFORMATION SYSTEMS
Introduction of systems and systems design. Prerequisites: 3, 73.160.

135. ADVANCED ACCOUNTING THEORY
Analysis of contemporary problems in accounting theory. Prerequisite: 132.

136. ADVANCED COST ANALYSIS
Standard costs and budgetary techniques for cost control. Cost and profit analyses for decision-making purposes, including direct costing, profit-volume analysis, and break-even analysis. Prerequisite: 3, 131.

137. AUDITING
The techniques of external auditing, which are based upon the purpose of an audit and upon the conventional standards to which these techniques should conform.

138. INCOME TAXATION I
Federal income tax practice and theory applied to the determination of tax liability of the individual. Similarities and differences, when appropriate, are indicated for partnerships and corporations.

139. INCOME TAXATION II
Federal income tax theory and practice applied to the determination of tax liability of corporations, partnerships, estates, trusts, and gifts.

191. INTERNSHIP
Opportunity for selected upper division students to work in local governmental units or firms. Prerequisite: Upper division standing and approval of the Undergraduate Committee.

198. INDEPENDENT STUDY

199. UNDERGRADUATE RESEARCH PAPER

SCHOOL OF BUSINESS AND ADMINISTRATION
DEPARTMENT OF ECONOMICS

Mario L. Belotti, Ph.D., *Chairman*

Professors: Mario L. Belotti, Thaddeus J. Whalen, Jr., William Donnelly, S.J., J. M. Heineke
Associate Professor: Henry Demmert
Assistant Professors: Richard T. Coz, S.J., Robert E. Looney, Marshall Medoff, Robert Springer, Masako Darrough

Required: 114, 115, 116, plus four electives.

Lower Division Courses

1. PRINCIPLES OF ECONOMICS I
An introduction to the general principles, terminology, and methods of macroeconomics.

2. PRINCIPLES OF ECONOMICS II
An introduction to the general principles, terminology, and methods of microeconomics.

12. AMERICAN ECONOMIC HISTORY
A study of the economic history of the United States with special emphasis upon basic economic organizations, such as the business enterprise, the labor union, and the economic functions of government.

20. CURRENT ECONOMIC ISSUES I
A study of contemporary macroeconomic problems. Prerequisite: Economics 1.

21. CURRENT ECONOMIC ISSUES II
A study of contemporary microeconomic problems. Prerequisite: Economics 2.

55. STATISTICS
Introduction to statistical methods and techniques of elementary statistical analysis.

Upper Division Courses

(Economics 1 and 2, or permission of the Undergraduate Committee, is required for all upper-division courses)

114. MICROECONOMICS I
An introduction to the theory of demand production, cost and pricing.

115. AGGREGATE ECONOMIC THEORY
The focus of this course is on the macro, or aggregative aspects of the economy. It emphasizes modern macroeconomic models which aim at explaining the level of output, employment and prices.

116. HISTORY OF ECONOMIC THOUGHT
A study of the evolution of economic ideas and their influence on the development of economic practices. Prerequisites: Economics 114 and 115.

117. EUROPEAN ECONOMIC HISTORY
A study of the preindustrial environment and industrial growth patterns of the western European countries.

118. COMPARATIVE ECONOMIC SYSTEMS
In this course the performance of market economies is contrasted to that of centrally planned, non-market economies and to that of "mixed" economies. The question of performance is addressed from both a theoretical and a practical point of view.

120. ECONOMICS OF THE PUBLIC SECTOR
In this course microeconomic theory will be applied to the analysis of the public sector. Prerequisites: Economics 114.

121. MICROECONOMICS II
The purpose of this course is to acquaint the student with applications of microeconomic theory to familiar economic problems.

122. MONEY AND BANKING
A theoretical, institutional, and historical approach to the study of money and banking, with particular emphasis upon the relationship between the monetary and banking system and the rest of the economy.

124. INDUSTRIAL ORGANIZATION
A microanalysis of the structure, conduct, and performance of American industry. Prerequisite: Economics 114.

125. WELFARE ECONOMICS
A study of the principles by which economists evaluate the social desirability of alternative market arrangements. Prerequisite: Economics 114.

126. ECONOMICS AND THE LAW
An application of the tools of economic theory to the analysis of law and legal institutions as they exist in the contemporary United States. Topics include a theory of property rights, the economics of the common law, income distribution and theories of economic justice, the economics of crime and punishment, antitrust law and regulatory law. Prerequisite: Economics 114 or permission of the instructor.

128. BUSINESS CYCLES AND FORECASTING
A study of the nature and causes of economic instability in an industrial economy.

129. ECONOMIC DEVELOPMENT
An analysis of the historical and theoretical context underlying present efforts to increase the rate of economic growth in underdeveloped countries.

130. LATIN AMERICA ECONOMIC DEVELOPMENT
An examination of the economic development of Latin American countries with particular emphasis on the relationships between economic growth and the social, political and economic structures of these countries.

131. AFRICA ECONOMIC DEVELOPMENT
A study of the economic development of Africa, with particular emphasis upon the relationships between economic growth and the social, political and economic structures of these countries.

132. ASIA ECONOMIC DEVELOPMENT
A study of the economic development of Asian countries with particular emphasis upon the relationships between economic growth and the social, political and economic structures of these countries.

133. SOVIET ECONOMIC DEVELOPMENT
A study of the economic development of the Soviet Union since the Communist Revolution.

134. GROWTH DYNAMICS AND PLANNING
A study of various theoretical growth models and their application to development, planning and project evaluation. Prerequisites: Economics 114 and 115.

140. URBAN ECONOMICS
This course examines the economics of urban problems with emphasis on location and land use, the housing market and transportation. The interac-

tion of location and land use decisions with the housing market and the transportation system is analyzed with reference to the amelioration of urban problems. Prerequisite: Economics 114 or permission of the instructor.

141. ENVIRONMENTAL ECONOMICS

A course in the application of basic economic principles to questions concerned with the appropriate use of environmental resources. Emphasis is on the role of cost/benefit analysis in designing environmental policy. Prerequisite: Economics 114.

150. LABOR ECONOMICS

A study of labor productivity, incomes, employment and how these are affected by labor organizations and labor legislation.

160. THE ECONOMICS OF POVERTY

A study of the economic conditions which lead to poverty and possible alternative policies directed at modifying such conditions.

170. MATHEMATICAL ECONOMICS I

In this course many familiar micro and macro economic models are generalized and reformulated as mathematical systems. Attention is focused on exploring the properties of these models using mathematical techniques. Emphasis is primarily on static models. Prerequisites: Mathematics 11 and 12, Economics 114 and 115, or consent of professor.

171. MATHEMATICAL ECONOMICS II

Analysis of dynamic economic models. Differential and difference equations are used to explore economic growth, technological change and other types in both macro and micro economics. Selected topics from the economics of uncertainty are also discussed. Prerequisites: Mathematics 11 and 12, Economics 114 and 115, or consent of professor.

174. STATISTICAL ANALYSIS

A course designed to acquaint the student with the foundations of statistical research methods. Topics include distribution theory, estimation, testing and prediction, with special emphasis upon multivariate models. Prerequisites: Mathematics 11 and 12 or equivalent.

177. ECONOMETRICS

An introduction to the techniques used by economists to estimate and test economic relationships. Focus is on regression analysis, time series problems and estimation of multiple equation models. Prerequisites: Economics 174 or equivalent.

180. INTERNATIONAL ECONOMICS
An analysis of the theory of international trade, of problems in balance of payments adjustments and of international economic policies. Prerequisite: Economics 114.

188. JUNIOR HONORS SEMINAR
Modern economic theories and problems. Reserved for Honors students.

189. SENIOR HONORS SEMINAR
Modern economic theories and problems. Reserved for Honors students.

190. INDEPENDENT STUDY

191. INTERNSHIP
Opportunity for selected upper division students to work in local governmental units or firms. Prerequisite: Upper division standing and approval of the Undergraduate Committee.

SCHOOL OF BUSINESS AND ADMINISTRATION
DEPARTMENT OF FINANCE

Francis J. Corrigan, Ph.D., *Chairman*

Professors: Francis J. Corrigan, D. Robert Papera
Associate Professor: Pretorius Van Den Dool
Professional Lecturer: Joseph F. X. Monasta

Required: 121, 125, plus three electives from the following 124, 126, 129, 148, 150, 151, 191, 198, 199, Economics 120, 122.

121. FINANCIAL MANAGEMENT
The basic financial structure of the firm is studied with emphasis on the procurement, allocation and control of both short and long-term funds. The firm's objectives of wealth maximization, liquidity and flexibility are examined with respect to initial organization, financial instruments and markets, measurement and analysis, and profit performance.

124. INVESTMENTS AND INVESTMENT INSTITUTIONS
This course is designed to serve the investment needs of individuals. Topics studied include formulation of investment goals and policies, types of investment media, investment risks and uncertainties, security analysis, investment decision-making and market behavior. Prerequisite: B.A. 121.

125. FINANCIAL POLICY
Traditional analytical and quantitative methodology is employed with respect to a study of a firm's optimum capital structure, fund flows, risk and uncer-

tainty, cost-of-capital and capital budgeting policies and valuation. Prerequisite: B.A. 121.

126. DYNAMICS OF THE FINANCIAL SYSTEM
Role and function of financial institutions, financial flows, interest rate structures, money, and capital markets. The implications for the formulation of business financial policy will be highlighted.

127. PERSONAL FINANCE
A survey course covering the various areas in personal financial planning. Topics will include: personal credit and its uses; home ownership (tax effects and other advantages); basic investment media; estate planning; etc. Prerequisite: none.

129. SENIOR FINANCE SEMINAR
Students study and discuss selected topics in financial management, theory, and research. The selected topics will be partially determined by interests of the seminar members. Emphasis is placed on discussion of a paper and individual reading.

148. PRINCIPLES OF INSURANCE
A survey course to acquaint the student with the general principles of insurance and their application to the various branches of the field.

150. LIFE INSURANCE
Studies of the theoretical concepts of the business and personal uses of life insurance and annuities.

151. INTERNATIONAL FINANCE
This course examines the functioning of the international monetary system as well as the financial problems of business firms operating internationally. Topics covered: transfer of international payments; foreign exchange rates; balance of payments; international liquidity; international investment; international financial markets; international banking; international financial management. Prerequisite: 121.

191. INTERNSHIP
Opportunity for selected upper division students to work in local governmental units or firms. Prerequisite: Upper division standing and approval of the Undergraduate Committee.

198. INDEPENDENT STUDY

199. UNDERGRADUATE RESEARCH PAPER

SCHOOL OF BUSINESS AND ADMINISTRATION
DEPARTMENT OF MANAGEMENT

Joseph M. Trickett, Ph.D., *Chairman*

Professor: Joseph M. Trickett
Associate Professors: Warner O. Brandenburg, Joel K. Leidecker, James Hall
Assistant Professors: Dennis Moberg, Barry Posner, Anthony Malo
Adjunct Lecturer: H. B. Kirshen

Required: 160, 162 plus any three to be selected from 158, 159, 164, 166, 168 and 171, 191, 197, 198 and 199 and Sociology 147.

11. BUSINESS AND SOCIETY
To discuss and clarify the role of business in modern society and its relationship with the social, political, and economic environments. The course emphasizes the external environment of Business and how these forces are influencing the scope functions and objectives of business institutions.

158. GOVERNMENT AND BUSINESS
A study of federal and state economic powers and how they have been used to promote and regulate business activity.

159. MANAGEMENT AND THE ARTS
The nature of management and the economic issues and problems concerning individuals and organizations in the fine arts and the performing arts.

160. ORGANIZATION AND MANAGEMENT
The nature and meaning of management work, the major areas of management operation, concepts of organization and their applications, departmental and interdepartmental organization and relationships.

162. BUSINESS POLICIES AND MANAGEMENT
A study of the interrelationship and coordination of prior functional and managerial courses leading to the formulation and administration of policy. Comprehensive cases comprise the basic material. Prerequisite: Senior standing.

164. OPERATIONS MANAGEMENT
Application of operational techniques, such as industrial engineering and cost analysis, to the management of manufacturing plants and other industries.

166. PERSONNEL ADMINISTRATION
An intensive review of the role and functions of the personnel department in business organizations, with particular emphasis on selection and place-

ment, training and development, and compensation systems. Prerequisite: 160.

167. INDUSTRIAL RELATIONS
The course deals with union-management relations, focusing on behavioral and legal dimensions. Much of the course involves the analysis of actual union-management cases.

168. MANAGEMENT OF HUMAN RESOURCES
Concepts to foster the effective utilization of human resources within the business organization—human behavior and job performance, motivation theory, interpersonal and group relationships, the management of conflict and change.

171. INDUSTRIAL PSYCHOLOGY
Psychological fundamentals affecting individual and group behavior in organizational situations. Emphasis on active student involvement, with considerable use of experiential learning.

191. INTERNSHIP
Opportunity for selected upper division students to work in local governmental units or firms. Prerequisite: Upper division standing and approval of the Undergraduate Committee.

198. INDEPENDENT STUDY

199. UNDERGRADUATE RESEARCH PAPER

SCHOOL OF BUSINESS AND ADMINISTRATION
DEPARTMENT OF MARKETING

Albert V. Bruno, Ph.D., *Chairman*

Professors: Paul L. Brown, Charles J. Dirksen, Ronald L. Stucky
Associate Professor: Albert V. Bruno
Acting Assistant Professor: Shelby McIntyre
Visiting Associate Professor: Michael Munson

Required: 181, 182; plus any three of the following: 165, 167, 178, 179, 183, 184, 185, 186, 187, 188, 189, 191, 198, 199, Economics 180.

165. RETAILING
A study of trends in retailing, and of the forces of competition which constantly introduce dynamic change into retailing. Prerequisite: 181.

167. PURCHASING
The problems of procuring and coordinating a flow of raw materials, parts, and supplies with the needs of production and operation of industrial and commercial organizations. Prerequisite: 181.

178. INTERNATIONAL MARKETING
This course seeks to provide students with an understanding of the principles and practices of international marketing, beginning with small companies concerned only with exporting and ending with an examination of the multi-national corporation. Emphasis is on decision-making, with considerable use of case studies.

179. SMALL BUSINESS ENTREPRENEURSHIP
Evaluating and beginning a new business venture including acquisition of existing enterprises.

181. PRINCIPLES OF MARKETING
An exploration of the nature of marketing, the analysis of marketing institutions, and the relationship between demand and marketing.

182. PRINCIPLES OF MARKETING
A continuation of 181. A study of pricing policies and public regulation of marketing.

183. MARKETING AGRICULTURAL PRODUCTS
A study of the types of agricultural products and their markets; middlemen and their services; price-determining factors; governmental agencies; cooperative marketing.

184. ADVERTISING
An analysis of the marketing psychological and social aspects of advertising. Prerequisite: 181.

185. SALES MANAGEMENT
An exploration of the systematic management of marketing activities, including the coordination of production and sales, product planning, and the administration of sales forces. Prerequisite: 181.

186. PRINCIPLES OF AGRICULTURAL PRODUCTS
A study of the American agricultural sector with emphasis on California; problem of production; comparative advantage of Western farm products on domestic and international markets; American contributions to world food supply.

187. DYNAMIC MARKETING MANAGEMENT: A COMPUTER GAME APPLICATION

In this course the student will be heavily involved with dynamic decision making. The focus of the course will be a competitive marketing game wherein student teams will make inferences about the business environment and will be continually confronted with dynamic competitive decisions which must be orchestrated over time. The team with the best marketing management will win. Lectures and exercises will complement the game and help participants improve their marketing decision making skills.

188. SEMINAR IN MARKETING—CONSUMER BEHAVIOR

This course explores the application of the behavioral sciences to the study of consumer behavior. The influences of perception, motivation, personality, learning, attitude, family and reference groups are investigated for their effects on specific areas of consumer decision making, such as problem recognition, alternative search and evaluation, and other pre and post purchase processes. Current research findings are discussed for each of the above areas in light of their application in formulating and implementing marketing strategy. Prerequisite: 72.182

189. MARKETING RESEARCH

A study of the application of marketing research methodology to the solution of business problems and of the survey method as used in marketing research. Prerequisites: 181, 182 and Senior standing.

191. INTERNSHIP

Opportunity for selected upper division students to work in local governmental units or firms. Prerequisite: Upper division standing and approval of the Undergraduate Committee.

198. INDEPENDENT STUDY

199. UNDERGRADUATE RESEARCH PAPER

SCHOOL OF BUSINESS AND ADMINISTRATION
DEPARTMENT OF QUANTITATIVE METHODS

Zeb L. Vancura, Drs. (Econ.), *Chairman*

Professor: Chaiho Kim
Associate Professors: Zeb L. Vancura, Norval Pohl
Assistant Professors: Kenneth Pacholke, S. Y. Tsai
Lecturer: Robert A. O'Brien, Jr.
Acting Assistant Professor: Charles Rogers

Required: 17 and 100, plus any four of the following: 101, 102, 104, 105, 106, 189, Mathematics 21, 53.

14. MATHEMATICAL CONCEPTS I

A pre-calculus transitional course for those students with limited background in algebra and analytic geometry. Topics include the real number system, fractions, exponents, linear and quadratic equations, inequalities, functions and graphs, straight lines, conic sections, systems of equations, and theory of equations.

15. MATHEMATICAL CONCEPTS II

Differential and integral calculus of one variable. After a brief review of functions and graphs, topics include limits and continuity, derivatives and applications, the integral and techniques of integration. Prerequisite: 14 or equivalent.

16. MATHEMATICAL CONCEPTS III

A continuation of 15 consisting of calculus of several variables and matrix algebra. Topics include partial differentiation, multiple integration, matrix operations, and applications of matrices to solving systems of linear equations. Prerequisite: 15 or equivalent.

17. COMPUTER CONCEPTS I

An introduction to computer fundamentals including hardware and software concepts. Logic and techniques of programming. Application to business problems.

40. STATISTICS

A study of the basic concepts of statistics and the use of statistical analyses in the solution of managerial problems. Topics include descriptive statistics, probability, sampling theory, estimation and hypothesis testing.

100. QUANTITATIVE METHODS I

A study of the application of the fundamental business operations research methodology for management decision making. Prerequisite: 40 or equivalent.

101. QUANTITATIVE METHODS II

The elements of modern decision theory and the application of statistical decision concepts to a variety of industrial problems. A computer-oriented course. Prerequisite: 100 or equivalent.

102. QUANTITATIVE METHODS III

The computer utilization in management. Students develop their own programs to analyze and solve a number of business problems. Prerequisite: 100 or equivalent.

103. QUANTITATIVE METHODS IV
The methods, tools, and techniques of management science applied to the problems of operations management. Prerequisite: 100 or equivalent.

104. MANAGEMENT INFORMATION SYSTEMS
An overview of the field of management information systems. Topics include: difference between data and information; the relationship of information theory to management and systems theory; the information system design and specification; the implementation, evaluation, and management of an information system. Prerequisite: 100, and the completion of (or current enrollment in) at least one class in each of the functional areas of business, i.e., economics, accounting, finance, management and marketing.

105. MANAGEMENT AND THE COMPUTER
An introduction to basic computer concepts and operation. An overview of the computer-based information system. The managerial and social implications of computer usage. Programming with a high-level timesharing language (BASIC). The relation of these concepts for problem solving in the functional areas of business.

106. SYSTEMS ANALYSIS
An introduction to the general concept of systems. Examination of information flows, tools, and activities of a systems analyst. Impact of systems implementation on the organizational structure. Decision rules in a system approach.

191. INTERNSHIP
Opportunity for selected upper division students to work in local government units or firms. Prerequisite: Upper division standing and approval of the Undergraduate Committee.

PUBLIC POLICY AND SOCIAL RESPONSIBILITY

Adjunct Lecturers: Joseph P. Kelly, Robert F. Jacobs

18. LEGAL ENVIRONMENT OF BUSINESS I
An examination of the law as applied to business and the environment.

20. LEGAL ENVIRONMENT OF BUSINESS II
Continuation of 18.

175. ADVANCED BUSINESS LAW
Prerequisite: 18, recommended for accounting majors.

192. MORAL PERSPECTIVE ON THE POLITICAL ECONOMY
Concentrate on conceptual foundation of government and business, comparative economic systems and selected issues in public policy, business practice and planning in the context of social responsibility and justice.

193. MORAL ASPECTS OF FOOD AND POPULATION POLICY
Examines the limits to growth in terms of food and population questions and analyzes leading issues in destruction of production factors and agricultural products.

197. MORAL RESPONSIBILITY AND BUSINESS PRACTICE
Examines issues of social justice and responsibility in terms of contemporary business policy and practice.

SCHOOL OF ENGINEERING

Robert Parden, Ph.D., *Dean*

" . . . it is a Catholic school, yet those of other faiths are admitted also, and their religious opinions are not interfered with . . . to cultivate the heart . . . a care of morals, no less than intellectual improvement, are duties kept sacredly in view . . ." wrote John Nobili, S.J., first President of the University of Santa Clara.

To these goals of fundamental knowledge—an inquiring mind, good habits of self-discipline, aptly expressed by Santa Clara's first president—the professional school adds the requirement of preparation to make a specific social contribution. Engineering knowledge was once passed from generation to generation in the familiar pattern of the apprenticeship. With the increasingly complex applications of science which provided the groundwork for the Industrial Revolution, those who were charged with applying science to the needs of the society in which they live—engineers—turned to the universities for increased formal preparation in science and mathematics. To accelerate the rate at which knowledge of contemporary engineering applications could be learned above that of the apprenticeship, schools of engineering developed—extending the curriculum beyond science and mathematics to include the methodology of engineering applications. Not only were the traditional goals of the University embraced, but to them were added specific professional needs—needs not only of the individual, but of the profession he represents.

The function of engineering is to bridge science and society; to modify nature to meet the needs of society within the restrictions dictated by social, political, and economic considerations.

In order to act as the bridge between science and society, the engineer must be both knowledgeable in science and sensitive to the means which can be used to satisfy social needs.

The rapid expansion of knowledge and complexity in all areas of science and engineering suggests the need to both broaden the educational program and to increase specialization. Both goals cannot be accomplished in four years. Because of the wide variety of engineering opportunities, and because so many graduates determine to go on for further study, the School of Engineering undergraduate curriculum minimizes specialization and combines it with general study in the humanities and the social and natural sciences.

Students who desire an even more liberalized approach to engineering education may elect the Bachelor of Science in Engineering degree program which permits additional courses in the life sciences, business administration, or the social sciences.

One-third of those students who earn Engineering degrees undertake graduate work in engineering. An additional group pursues graduate work in law, medicine, business administration, city and regional planning, and other areas where an undergraduate preparation combining science, applied science, and the liberal arts is desired.

The engineering activity requires all types of people with different interests, preparations, and abilities. Regardless of the field of engineering, there is a pattern of assignments describing the kinds of jobs in which engineers engage. These include:

Technical Management in which the engineer directs a team of engineers—technicians, mechanics, and other skilled artisans.

Consulting in which the engineer alone, or as part of a firm, offers his services to a client needing professional counsel.

Design in which the engineer plans structures or systems, using his knowledge of scientific principles and the properties of materials.

Research and Development in which the engineer seeks additional knowledge about basic, physical phenomena and develops this knowledge into a product of service. In this assignment the engineer works closely with the scientist, and often their division of labor is difficult to identify.

Construction and Production in which the engineer translates the design engineer's drawings and specifications into structures, machines, or systems.

Teaching in engineering schools and colleges.

These are general assignments. Engineers also undertake assignments which require engineering background and experience, such as administration, management, and sales.

ENGINEERING AT SANTA CLARA

The undergraduate programs leading to the Bachelor of Science in Engineering and in Civil, Electrical, and Mechanical Engineering were first offered at the University of Santa Clara in 1912. They were accredited by The Engineers Council for Professional Development in 1937. Since that time the Master of Science in Electrical, and Mechanical Engineering, in Computer Science, Engineering Mechanics, Applied Mathematics, Public Works Administration; the Master of Science in Engineering, the Engineer's degree in Electrical, Mechanical, and the Doctor of Philosophy in Electrical Engineering programs have been added.

FACILITIES FOR ENGINEERING

The School of Engineering's laboratories are contained in three buildings in the Sullivan Engineering Center built in 1960. A lecture, seminar, and office building completes the complex.

Civil Engineering Laboratories

The Mechanics of Materials Laboratory contains testing machines which have a maximum capacity of 200,000 pounds. Hardness, fatigue, impact, torsion testing and photoelastic equipment are used for instruction and research. A wide selection of electric strain-gaging apparatus is available for static, dynamic, and repeated loads. These include regular and recording oscilloscopes, low-frequency strain recorders, and static strain indicators.

The Soil Mechanics Laboratory is equipped with the most recently developed apparatus for the physical testing of soils. The laboratory contains consolidation devices and triaxial compression testing units equipped for controlled stress, controlled strain, or cyclic loading, and equipment for sampling preparation, permeability tests, laboratory compaction of soils, and determination of water content, specific gravity, and consistency limits.

Electrical Engineering Laboratories

Laboratories and facilities are available for research and instruction in electrical machinery, electric controls and servomechanisms, computing, electrical measurements, electronics, and communications.

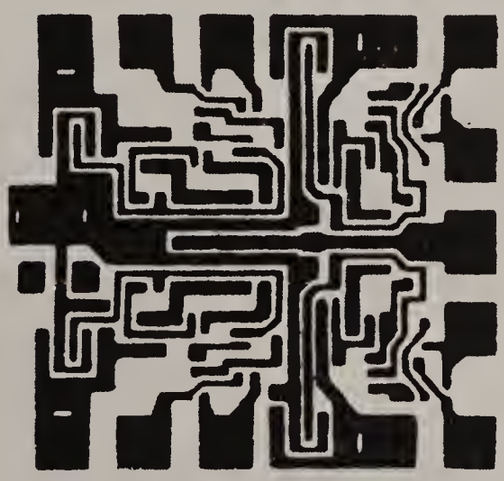
The Computing Laboratory includes a general purpose mini computer, several microprocessor development systems, terminals, and recording and other accessory equipment, coupled with a range of software support for these systems. These facilities are used primarily for student and faculty research, including development of new computing devices and techniques.

In addition to this computer facility within the Department, two of the University's general purpose digital computers are located nearby. Computing time is available for regularly scheduled instructional classes and for the research activities of graduate students and the Engineering faculty.

The Electronics and Communications Laboratories provide modern facilities in electronics, radio communication, and microwaves. These laboratories are equipped with signal generators, oscillators, precision bridges, cathoderay oscilloscopes, spectrum analysers, O-meters, wave analyzers, an artificial transmission line, and other precision measuring equipment.

The Control Systems Laboratory is well-equipped with modern instruments for experimental studies of individual control-system components and of complete systems. In addition to the usual electronic test equipment, there is equipment for construction and test of many types of servos, modern oscillographic recorders, and numerous analog and digital components. From time to time additional special-purpose test equipment is constructed to facilitate studies of adaptive control systems, digital control systems, and carrier control systems, among others. This equipment is frequently supplemented by the use of analog and digital computers located in adjacent laboratories.

The Electro-mechanical Energy Conversion Laboratory is equipped with Westinghouse generalized machines, transformers, and associated equipment.



Mechanical Engineering Laboratories

The Mechanical Engineering Laboratories include bench laboratories and a high-bay facility for experimentation in free-fall systems, fluid mechanics, thermodynamics, heat and mass transfer, propulsion, combustion, power generation, and air conditioning.

A variety of internal combustion engines installed on dynamometer stands can be used for studies in diesel and spark-ignited engine performance. An axial-flow fan with adjustable blades attached to a wind tunnel permits a variety of experiments to be performed in aerodynamics and turbomachinery.

The fluid dynamics area contains equipment to illustrate the principles of fluid flow and to familiarize the student with basic elements of hydraulic machinery and their associated instrumentation. Each device may be supplied directly from a pump or from a constant level standpipe with a 25-foot head.

Included in the Mechanical Engineering Laboratories is the equipment associated with electro-mechanical energy conversion. A variety of direct- and alternating-current machines, transformers, and associated equipment is available.

A unique approach is made in utilization of a complete metal processing facility. The first course in this area is taught by an engineer in order that the students become familiar with machine-tool processes from an engineering design point of view. The student further utilizes the shop facility during his thesis activities. The facility is also utilized for construction and maintenance of experimental apparatus.

Recent additions to the laboratory facilities are a calorimeter for determining human metabolic behavior, high vacuum fuel ignition apparatus, and electronic instrumentation for detailed study of combustion exhaust pollutants.

Data Processing Center

The Data Processing Center of the University includes two separate installations located in the Sullivan Engineering Center. HP 2100 and 3000 digital computers with a full range of peripherals and several programming languages, are used for teaching and research by faculty members and students. Introduction to computer programming is part of the freshman program. Several undergraduate courses require the use of this facility as part of their regular laboratory. Other computer facilities are available in the Electrical Engineering Laboratories.

RIGHTS RESERVED

The curriculum and regulations affecting students may be revised at any time at the discretion of the University administration.

UNDERGRADUATE PROGRAMS

The undergraduate programs lead to Bachelor of Science degrees in Civil, Electrical Engineering, Computer Science and Mechanical Engineering, and a more general program for the Bachelor of Science in Engineering degree.

The undergraduate degrees are earned by completion of 44 term courses with an overall grade average of at least C (2.0). Eleven courses are normally scheduled in each year.

The core program in which students enroll who are earning the Bachelor of Science in Civil Engineering, Electrical Engineering and Computer Science or Mechanical Engineering includes:

	FRESHMAN	
Mathematics 11	Mathematics 12	Mathematics 13
Chemistry 1	Chemistry 2 or 4	Physics 4
Engineering 10 (F,W,S)	Engineering 3 (F,W,S)	Elective
Elective	Elective	
	SOPHOMORE	
Mathematics 21	Physics 6	Engineering 101 (F, S)
Physics 5	Engineering 42 (W, S)	or Engineering 120 (F, S)
Engineering 41 (F, W)	Elective	Elective
Elective	Elective	Elective
	JUNIOR	
Engineering 102 (F, W)	Engineering 102, 103	
or Engineering 103 (F, W)	or 121	Elective
Engineering 121 (F, W)	Elective	Elective
_____	_____	Elective
_____	_____	
	SENIOR	
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	

Note: F,W, or S refers to the term in which a course is normally scheduled. These and other courses may be scheduled in any term as described in the schedule of courses published before each registration.

Electives: Ten humanities or social science electives and two unrestricted electives are to be scheduled. In-coming first-time freshman students must take three religious studies courses while at the University of Santa Clara, two of which must be lower-division courses taken during the freshman or sophomore years and the third course must be an upper-division course taken during the junior or senior years. Students entering the University with less than 44 quarter units are required to complete three courses in religious studies, at least one of which must be completed during one of

the two final years. Students entering with more than 43 units but less than 88 must complete two courses, one of these during the final two years; those entering with more than 87 quarter units must complete one course before graduation. Three additional electives must be selected from the following list:

English 1, 2, 3, 11, 12, 13, 71, 73, 101, 102
Theatre Arts 1
Economics 1, 2, 12, 114

A twelfth, optional course can be scheduled in any term, each year, but it is not a degree requirement.

Students in electrical engineering and computer science should take EECS 101 as sophomores. Other engineering students may defer selected upper division core courses (courses numbered 100-200) to the junior or senior year, but the sooner they are taken the greater will be the flexibility in arranging upper division programs.

The following are the departmental requirements:

Civil Engineering: 10, 20, 115, 121, 130, 131, 135, 140, 141, 145, 193, 198, Engineering 43 and 2 technical electives;

Electrical Engineering and Computer Science: both E102 and 103; EECS 104, 111, 121, 131, 151, 198, and Applied Mathematics 106; One of the four following Options. (A) General Electrical Engineering: Physics 7, EECS 161, 4 additional departmental courses, 1 additional technical elective and 2 free electives. (B) Electronics: Physics 7, EECS 108, 112, 152, 153; one technical elective and 2 free electives. (C) Computer Science: Chemistry 1 and 2 may be omitted; Math 32, 52, 53; Applied Math 118, EECS 15, 22, 122, 123; 1 technical elective and 2 free electives. (D) Networks and Systems: Chemistry 1 and 2 may be omitted. Applied Math 118, 135, 136, 145, 146 and a choice of 170, 171 or 140, 141; EECS 112, 114, 132; 2 technical electives and 2 free electives.

Mechanical Engineering: 11, 15, 110, 111, 125, 135, 140, 142, 198, Engineering 43, 132, or ME 150 and 151, Applied Mathematics 106 and 118 and 2 free electives.

Senior Thesis. All students seeking a degree in Engineering are required to submit a thesis during their senior year.

The senior thesis provides a student with the opportunity to carry out an original investigation in an orderly fashion, the momentum of progress being supplied primarily by the student's enthusiasm, interest, and effort. The project is scheduled throughout the senior year and must be submitted before the student is admitted to his final examinations.

It is felt that a good undergraduate thesis:

1. Should involve an element of originality. It should be an investigation on the frontier of the student's knowledge.

2. Should require an element of design, an element of equipment assembly and utilization of instrumentation and a test program.

3. Should include successful evaluation of results utilizing sound test techniques and application of fundamentals of engineering. It is desirable that the evaluation require an extension of previous information to cope with the thesis project.

The Department chairman appoints a thesis advisor. The advisor will approve the thesis subject and method of approach, the outline of the thesis, initial drafts and final copy of the thesis as the project develops.

THE DA VINCI PROGRAM

This Bachelor's Degree program is designed to give each student a thorough grounding in the fundamentals of engineering, physical science, mathematics, the applied sciences, humanities and the social sciences, which are relevant to all branches of engineering and thus provide a permanently useful core of knowledge. Provision is made for a limited amount of specialization in a major field. This program provides a base for more advanced and specialized instruction at the graduate level. This program name, from the 15th century, was selected because Leonardo da Vinci personifies many of the goals of this new general education plan.

Da Vinci was known for his extraordinary power of illustration, not only in the fine arts but also for technical structures, for his familiarity with the properties of different substances and the varied possibilities of their use in the workshop, plus his research efforts using simple mathematical laws of nature. All of these skills made him an engineer in the most contemporary sense.

Three kinds of students particularly will find this new program attractive:

Those who want to be engineers, but don't want to specialize as undergraduates.

Those who don't know what they want to do but who want to keep their options open and be prepared and qualified for career opportunities in this fast-paced technological world.

Those who have non-engineer career objectives, but want a good, general, scientific, humanistic, technologically-sensitive education for the Seventies.

In a 44 term course program, 27 of the courses include the engineering core program. The remainder of a student's program is selected from throughout the University. The program can satisfy a number of goals:

Permits its majors to go on for graduate work in medicine, law, business, teaching, and, of course, engineering.

Helps students select an area of speciality during their undergraduate years by a sampling of different careers through a mini-course program.

Offers a six months internship during the junior year (and summer) for academic credit and actual work experience.

Provides its recipients with a well-rounded general education before they enter a technologically dependent society.

A more detailed description of the program may be obtained by writing to the Dean of Engineering. Sample curricula are described, including career objectives in business, environmental studies, medical instrumentation, engineering management, public administration and similar engineering-related careers.

SCHOOL OF ENGINEERING
TECHNOLOGY AND MODERN LIFE

Courses 1-30 Open To All Students In The University

It has been proposed that man is losing control of his destiny because of rapid advances in technology. Local transportation systems are inadequate, costly, inconvenient or contribute to pollution. Power generation and distribution disturbs the landscape and creates air and water pollution. The computer is identified with the growing complexity of conducting our daily lives.

Technology has also strongly influenced communications, so that we are able to see and to be seen, instantly, around the world and in space. It has changed campaigning, and the reporting of prices in world markets. Our recreational patterns are changed by equipment, ground and air travel. Technology has an impact on every facet of our lives.

The impact of technology will not lessen in the future, it will accelerate. However, the nature of the impact can be altered. It will be altered as a greater number of people gain knowledge of the complex system within which technological, social, economic and political choices take place, and the impact of one choice upon the other.

Courses 1-30 are organized to systematically explore the interaction of technology and the environment. In addition, these courses will be presented in such a manner that the individual can reinforce his current interests, or further explore those parts of the system, our world, with which he might become involved in the future. Guest speakers and field trips, projects and term papers will facilitate this understanding.

NOTE: UNLESS DESIGNATED TO THE CONTRARY, ALL COURSES OFFERED BY THE SCHOOL OF ENGINEERING EARN 4 QUARTER UNITS CREDIT.

1. ENERGY AND THE WORLD'S RESOURCES

Man needs energy to survive. But the misuse of energy may destroy him. Can this dilemma be resolved? How are gas, oil, water, coal, and the sun related to technology and the social, economic and political problems of generating electric energy?

2. CONSUMER AND ENVIRONMENTAL CONCERNS

An examination of consumer products in terms of purpose, performance, safety, resource utilization, and environmental consequences. Students will make a product evaluation as a course project. Legal, legislative, and ecologic view points will be presented by guest speakers.

3. INTRODUCTION TO COMPUTING

History of computational needs and devices. Algorithmic problem-solving; flow charts. Basic Computer concepts and organization. Number systems and data types. This course is intended for all students. Prerequisite: High school algebra.

5. INTRODUCTION TO ENGINEERING

Discussion of significant engineering problems of the present and future. Field trips. Open to all students to familiarize the engineering student with his chosen field and to acquaint the non-engineering student with the engineering profession.

6. ECOLOGY AND POLLUTION

The man-made world and its impact on the environment; ecology, energy of resources and the generation of power, air pollution and water pollution. The fundamental principles in these various areas will be explored and related to critical contemporary problems and issues.

7. THE DYNAMICS OF SAILING

The principles of physics are applied to the art of sailing. Concepts of lift and drag, relative motion and meteorology are studied and related to the techniques and tactics of sailing.

10. INTRODUCTION TO ENGINEERING DESIGN

Principles of orthographic projection and descriptive geometry applied to the representation, visualization and solution of engineering design problems.

12. DESIGN OF RESIDENTIAL DWELLINGS (2)

Properties of materials of construction. Application of Uniform Building Code and other design data information. Open to sophomore, junior, and senior engineering students.

30. MACRO ENGINEERING AND PUBLIC POLICY

The social-economic-political-technological-natural environment in which engineering systems are conceived, approved, financed, designed, constructed, and operated. For freshmen or sophomores.

31. ENGINEERING SYSTEMS DESIGN

Systems analysis and design applied to organizational and technological processes. Integration of system objectives, personnel, facilities and equipment.

41. MECHANICS I

Resolution and Composition of force systems and equilibrium of force systems acting on structures and mechanisms. Introduction to stress and strain analysis. Prerequisite: Physics 4.

42. MECHANICS II

Dynamics of a particle and dynamics of rigid bodies. Introduction to theory of vibrations. Prerequisite: Mechanics I.

43. MECHANICS III
Analysis of stresses and strains in bodies undergoing various loading conditions. Energy theorems and their applications. Laboratory. Prerequisite: Mechanics I.

101. PRINCIPLES OF ELECTRICAL CIRCUITS
The physical basis and mathematical models of circuit components and energy sources are introduced. Circuit theorems and methods of analysis are applied to D.C. and A.C. circuits. Laboratory. Prerequisites: Math 21, Engineering 41.

102. PRINCIPLES OF ELECTRICAL CIRCUITS
Introduction to electronic devices. Analysis of linear and non-linear electronic circuits—containing diodes and transistors. Operational amplifiers. Introduction to digital circuits. Laboratory. Prerequisite: Engineering.

103. PRINCIPLES OF ELECTRICAL MACHINES
Magnetic circuits, transformers, DC and AC generators and motors. Prerequisite: Engineering 101.

120. THERMOFLUID MECHANICS I
An integrated study of the fluid mechanics and thermodynamics of engineering systems. Laboratory. Prerequisite: Engineering 41.

121. THERMOFLUID MECHANICS II
A continuation of Engineering 120. Laboratory. Prerequisite: Engineering 120.

132. ECONOMICS OF ENGINEERING SYSTEMS
Economic systems. Time value of money. Basic techniques of economic analysis of engineering projects. Planning and capital budgeting. Regulatory agencies. Cost-benefit analysis.

170. ENGINEERING MANAGEMENT I

The principles and practices of administration of engineering and science activities, including nature of management, organization, planning, controlling action and measuring results, management of human resources, communication, decision making, etc.

171. ENGINEERING MANAGEMENT II

Principles and procedures of creative problem solving including the use of brainstorming sessions. A step-by-step formulation of the practical techniques by which creative imagination can be more productively utilized. Special attention is given to the development of professional creativity habits through formulating basic plans, investigating directions, developing methods, and optimizing and completing solutions.

172. PROBLEMS IN ENGINEERING ADMINISTRATION

A thorough study by the case method is made of engineering management and administrative procedures in recognizing and solving engineering problems. The cases studied cover a wide variety of engineering management situations, both technical and administrative.

173. DESIGN OF AN ENTERPRISE

Projects involving design of an enterprise considering: product design, market research, forecasting, processing, plant design, and cost analysis.

176. OPERATING SYSTEMS I

Translation of product and service requirements into facilities, procedures and operating organizations. Determination of effective methods and selection of production alternatives; plant layouts, buildings and building locations, applications of numerical methods and operations research techniques, appropriate to production management decision-making.

177. OPERATING SYSTEMS II

An examination in detail of some of the significant techniques applied by operating management. The student will approach the topic from two directions; research papers on specific topics and a semester class project involving the study of operating systems as they actually function in local enterprises.

179. SYSTEM ANALYSIS AND DESIGN FOR DATA PROCESSING

Principles of commercial data processing treated from a system engineering viewpoint. Applications of unit record equipment and computers are analyzed in terms of system design.

181. R & D MANAGEMENT I

An analysis of the issues and concepts involved in the management of research and development and its functional relationship to other elements of the corporate structure. Particular attention is given to the functional charac-

teristics of the product line; to company growth by technological innovation; the application of systems engineering concepts to the corporate organization, and the changing concepts in management structures to accommodate advances in science and technology.

182. R & D MANAGEMENT II

An analysis of the issues and concepts involved in the strategic and corporate development planning in the modern technologically oriented company. Particular attention is given to the fundamentals of corporate planning as they relate to the R & D and product planning of the corporation.

183. GOVERNMENT CONTRACT ADMINISTRATION

The underlying basic philosophy of contracts as developed by the government is presented in some detail, and varying contractual relations between the government and industry are studied.

185. OPERATIONS RESEARCH I

A review of probability theory, matrix algebra, calculus, differential equations, linear programming, and other mathematics used in the study and application of Operations Research, followed by a comprehensive study of engineering management problems to which the quantitative methods of analysis and solution may be applicable.

186. OPERATIONS RESEARCH II

Game theory, queuing theory, information theory, and various other such techniques. Examples of applications of techniques to common industrial problems in production, inventory analysis, and scheduling.

187. RELIABILITY ENGINEERING

A study of methods and procedures useful in forecasting, predicting and evaluating engineering design, utility and reliability. Various mathematical and statistical tools are employed including PERT. Appropriate standards are determined and applied in reliability engineering.

188. ECONOMIC DECISION MODELS

Economic and financial considerations in engineering decisions. Decision criteria under certainty, risk, and uncertainty. Cost concepts, financial calculations, capital sources, accounting data, depreciation, comparison of alternatives, minimum cost or maximum profit determination, replacement and economic life, breakeven analysis, intangible factors.

189. HUMAN ENGINEERING

A study is made of the physiological and psychological processes as related to the optimal design of machines and equipment. Problems in visual displays, auditory communications, control systems, extreme environments, and measurement of human error in a wide variety of situations.

190. BEHAVIORIAL SCIENCES IN ENGINEERING MANAGEMENT
Advanced study of research methodology, and findings of the behavioral sciences which are particularly relevant to the management of economic enterprise. Interdisciplinary approaches to business behavior. Motivation and perception as related to work and productivity, interpersonal work relations, group functioning, and associated topics.

191. PROBLEMS IN HUMAN RELATIONS
Morale and discipline in management situations; case studies stressing the prevention of and solution to employee problems by means of appropriate policies, techniques, practices, and procedures. Group dynamics is encountered from the point of view of both psychological and sociological factors under varying situations, especially industrial.

190. INDEPENDENT RESEARCH
For those who are enrolled in the da Vinci program.

191. OFF-CAMPUS INTERNSHIP
Open to juniors during their spring term. The student spends the entire term off campus as an intern in a governmental agency, industry or organization of the student's choice. Written and oral presentations required.

197. DIRECTED READING
For students who wish to do intensive reading in areas not emphasized in course work.

199. INDEPENDENT STUDY (2)
Students select topic of interest, and make weekly written and oral presentations of their findings.

SCHOOL OF ENGINEERING
APPLIED MATHEMATICS PROGRAM

Gerald Markle, Ph.D., *Coordinator*

Lecturers: Stan Basin, Charles H. Chicks, Raul Conti, Wade H. Foy, William T. Hatley, Charles M. Hogan, Paul O. Scheibe, Jerome G. Sowul

The Applied Mathematics faculty is composed of members of several University departments, including Mathematics, Engineering, Chemistry, and Physics. With the exception of the three courses below, most of the Applied Mathematics Program is designed for graduate study. A complete listing of the offerings may be found in the *Bulletin of Graduate Courses and Degrees of the School of Engineering.*

106. DIFFERENTIAL EQUATIONS

First-order linear differential equations, systems of linear differential equations, homogeneous systems of linear differential equations with constant coefficients, the Laplace transform, the solution of differential equations by Laplace transform. Prerequisite: Mathematics 21.

108. PROBABILITY AND STATISTICS

Definitions of probability, sets, sample spaces, conditional and total probability, random variables, distributions, functions of random variables, sampling, estimation of parameters, testing hypotheses.

112. INTRODUCTION TO PROBABILITY THEORY

Definitions, sets, conditional and total probability, the binomial distribution approximations, random variables, important probability distributions, functions of random variables, moments, characteristic functions, joint probability distributions, marginal distributions, sums of random variables-convolutions, correlation, sequences of random variables, limit theorems.

118. NUMERICAL METHODS

Fortran programming concepts. Numerical solution of algebraic and transcendental equations, finite differences, numerical differentiation and integration, and solution of ordinary differential equations. Solution of representative problems on the digital computer.

SCHOOL OF ENGINEERING
CIVIL ENGINEERING AND ENGINEERING MECHANICS

Morgan Johnson, Ph.D., *Chairman*

Professor: Morgan Johnson
Associate Professor: Harold M. Tapay
Assistant Professor: Jon D. Raggett
Lecturers: David B. Ashley, Sam M. Cristofano, Norman A. Cyr, Richard B. DeLong, Patrick Ferrard, Sanford Getress, Ronald D. Gruenwald, David E. Hartley, John Hopkins, Richard A. Hughes, Marshall B. Marlowe, O. Lee Mitchell, Wilmot J. Nicholson, John O'Halloran, Gay L. Pang, Emanuel H. Pearl, Bernard Ross, Urban J. Schreiner, Olney Smith, Wesley D. Smith, Samuel A. Sperry, Jeremy Wire

Civil Engineering encompasses the fields of Water Resources Engineering, Structural Engineering, Public Works Engineering, and Construction Engineering.

Water Resources Engineering deals with the utilization and conservation of water resources such as surface and ground waters, water supply and distribution, sewage collection and disposal treatment methods, and flood control and irrigation projects.

Transportation Engineering relates to the planning, design, and operation of highways, airports, railways, waterways, and specialized facilities such as tunnels, canals, and harbors.

Structural Engineering involves planning and design of such structures as bridges, industrial and commercial buildings, and various special-purpose structures.

Public Works Engineering is a field of application of principles of engineering design and management to streets, sewers, water supply, structures, solid wastes, transportation, and other public engineering functions.

Civil engineering students by careful choice and scheduling of electives, in consultation with an advisor, are able to develop an option program in Construction, Public Works, or Structures, in addition to the courses required of all civil engineering graduates.

Additionally, civil engineering seniors are offered the option of spending the entire winter quarter in an engineering, contracting, or public works office as an intern, learning the functions of that example of the civil engineering function.

10. SURVEYING

Survey instruments—their use, and care. Principles of topographic mapping, linear measurements, leveling, traverses, curves, boundary and public surveys. Field practice.

20. GEOLOGY

Development and formation of geologic materials. Significance of structure, land form, erosion, deposition. Stream and shoreline processes. Surface and subsurface water. Laboratory. Prerequisite: Sophomore standing.

100. CIVIL ENGINEERING DESIGN PROCEDURES

Applications of engineering drafting techniques and procedures to graphs, illustrations, and engineering plans.

115. MATERIALS ENGINEERING

Origin, manufacture, and processing of materials used in civil engineering. Physical properties of metals, wood, plastics, cement, concrete and other engineering materials. Corrosion and its prevention. Fire resistance.

118. CONSTRUCTION ENGINEERING I

Licensing. Drawings and specifications. Cost Analysis, estimating and bidding. Contracts. Bonds. Financing. Insurance. Labor Legislation. Planning and scheduling.

121. SOILS ENGINEERING

Origin, development and properties of soils. Classification of soils and applications of physics and engineering mechanics to soil as an engineering material. Water in soils. Compaction, stabilization, consolidation and bearing capacity. Laboratory. Prerequisites: 20 and E43.

130. STATICALLY DETERMINATE STRUCTURES
Member actions and displacements are found for statically determinate continuous beams, trusses, frames, and arches. Deflections are computed by direct integration where possible, and, in general, by Castigliano's Second Theorem. Design Laboratory. Prerequisite: E43.

131. STATICALLY INDETERMINATE STRUCTURES
Statically indeterminate continuous beams, trusses, frames and arches are analyzed, in general by both the flexibility and stiffness methods. In addition, slope-deflection equations and the three-moment equation are developed for continuous beams, and moment distribution is developed for frames. Design Laboratory. Prerequisite: CE 130.

133. TIMBER AND PRESTRESSED CONCRETE DESIGN
Design of all timber structures, and design of prestressed concrete structures. Particular attention will be given to the design of connection details. The complete design of simple structures made of both materials will be required. Three lectures and one laboratory weekly. Prerequisite: CE 130 and 135.

135. REINFORCED CONCRETE DESIGN
Analysis and design of reinforced concrete structures. Introduction to theory of pre-stressed concrete. Prerequisite: 130

136. ADVANCED CONCRETE DESIGN
Theory and practice of the design of bridges and other concrete structures. Design of prestressed concrete members. Prerequisite: 135.

137. FUNDAMENTALS OF EARTHQUAKE ENGINEERING
Causes and characteristics of earthquake motions. Introduction to the dynamics of single- and multi-degree-of-freedom lumped mass systems. Introduction to finite element modeling of framed structures. Idealization of real structures and analysis of idealized models by time-history and response spectrum methods. Special considerations for earthquake resistant design of steel, timber, and reinforced concrete structures.

138. FOUNDATIONS ENGINEERING
Surveying, mapping, and foundation exploration; slope stability and settlement analysis; spread foundations; piles and caissons; earth-retaining structures; loads on underground conduits; subsurface construction. Prerequisites: 121 and 135.

139. HYDROLOGY AND DRAINAGE
Precipitation, evaporation, transpiration, runoff and infiltration. Drainage areas, concentration points, and storage. Sub-surface movement and recharge. Street, highway, and airport drainage. Pre- or co-requisites: 121 and E120.

140. WATER RESOURCES ENGINEERING

Concepts of various aspects of water resources: storm and flood waters, ground waters, water supply and distribution, sewage collection and disposal, and irrigation. Interrelationship of all aspects. Importance of water resources to the total needs of the community. Prerequisite: E120.

141. HYDRAULIC ENGINEERING

Principles of hydraulics; closed conduit and open channel flow; transitions and structures; culverts; sedimentation and tractive resistance. Prerequisite: E120.

142. WATER RESOURCES DESIGN

Design of storage facilities, water distribution systems, storm and sanitary sewer systems, treatment plants, and swimming pools. Prerequisites: CE 140 and 141.

143. ENVIRONMENTAL ENGINEERING

Public control of water-born and air-born diseases; vector and weed control; pesticides; food protection. Management of solid wastes; air pollution control; water quality control. Recreational facilities and the residential environment. Planning, organizing, and managing environmental programs. Prerequisites: Biology 9 or Chemistry 2 or equivalent; junior or senior status.

144. ENVIRONMENTAL PLANNING

Physical and esthetic features of the environment and their influence on planning. Soil, geologic, and flooding hazards. Preservation of open space and amenities. Air quality; water quality, congestion. Applications to project planning. Prerequisite: Junior or senior status.

145. TRANSPORTATION ENGINEERING

Transportation as a system to meet the needs of society in movement of people and goods. Interaction between transportation facilities and the community. Engineering aspects of rail, highway, air and water carriers and routes. Modern concepts and technology.

146. URBAN AND REGIONAL PLANNING

Principles of city and regional planning. Organization and functioning of planning agencies. Urban and regional problems and their influence on planning. Features of general plans. Prerequisite: Junior or senior status.

147. PAVEMENT DESIGN

Paving materials. Geometric and structural design of highways. Urban street layout and details. Layout and design of airport runways, taxiways, and aprons. Pre- or co-requisite 121.

148. CONSTRUCTION ENGINEERING II
Construction methods and equipment. Legal aspects of construction. Construction site organization. Prerequisites: 130 and 135.

190. INDEPENDENT RESEARCH
Open to Departmental Scholars only.

191. EXTERNSHIP (4, 8, or 12 units)
An option for graduating seniors to spend the entire winter quarter off campus with an engineering agency.

193. PROJECT DESIGN
Each senior carries a project of his choosing from inception to plans.

198. THESIS AND SEMINAR
Senior students conduct an independent engineering investigation and report it in formal style.

199. INDEPENDENT STUDY
Open to Departmental Scholars only.

SCHOOL OF ENGINEERING ELECTRICAL ENGINEERING AND COMPUTER SCIENCE

Shu-Park Chan, Ph.D., *Chairman*

Professors: Shu-Park Chan, Timothy J. Healy, Dragoslav D. Siljak
Associate Professors: Henry P. Nettesheim, Jack A. Peterson, Raymond B. Yarbrough
Assistant Professors: William R. Dunn, Jr., Ronald L. Danielson, Daniel W. Lewis
Lecturers: Russell Apfel, Jack C. Armstrong, Hal T. Barraclough, Yaakov Bar Shalom, John D. Bruce, George S. Cohen, Conrad J. Dell'Oca, Michael P. Ekstrom, Peter E. Gise, Allen W. Hathaway, Jan A. Janku, William P. Jones, Michael A. Kelly, Glen G. Langdon, Donald P. Leach, Tuk-Hop Lee, Charles T. Leis, Adam Lender, Robert N. Linebarger, Stephen Ludvik, Dale R. Lumb, David T. Magill, Gilbert M. Masters, James McClure, Evan Moustakas, Enjeti S. Murthi, Gust Perlegos, Raymond Pietila, Howard T. Russell, Donald Slutz, Edward H. Snow, George J. Thaler, David Van Voorhies, Charles S. Weaver, Al Weissbluger, Charles Wojslaw, Stanley Zaffos

Electrical Engineering and Computer Science includes the design, construction, and operation of equipment for generation, transmission, and utilization of electrical energy. Electrical engineers and computer scientists are concerned with all phases of the electrical transmission of information such as radio, television, and telephone. Data processing equipment and computers used by business, industry, and govern-

ment are included in their major area of interest. Much of the equipment used in maintaining our national security is powered and controlled by electric and electronic mechanisms.

The computer science program (which includes EECS 15, EECS 22, EECS 121, EECS 122 and EECS 123) permits undergraduates in Engineering, as well as other schools of the University to take courses dealing with various aspects of computer science during all four years of their baccalaureate program. Students wishing to acquire an even more extensive background in computer science may make special arrangements to take graduate computer science courses as well.

The Computer Science program is supported by the facilities of the University Computing Center and the Digital Systems Laboratory. The principal computer for academic functions include the Computer Center's Hewlett-Packard HP 2100 and the departments Digital Equipment Corporation PDP-11. An HP-3000, used primarily for administrative data processing, is also available. The Digital Systems Laboratory provides complete facilities for experiments and projects ranging in complexity from a few digital integrated circuits and other electronic components to complete computer systems. A unique feature of the Laboratory is the availability of take-home "breadboard" facilities which permit students to design, construct, and test any sort of digital module or system using the most modern integrated circuits available at home, in the dorm, or even at a ski lodge. A microprocessor laboratory is currently under development as well, and will include four different microprocessors and associated peripherals.

15. INTRODUCTION TO COMPUTER SCIENCE

Discussion of data structures (arrays, trees, lists, etc.) and algorithms (searching, sorting), and the implementation of both using high-level programming languages. Procedures, scope of variables; use of iteration and recursion; techniques for structural programming. The principal languages used are ALGOL and SNOBOL. Prerequisite: E3 or equivalent.

22. MACHINE ORGANIZATION AND PROGRAMMING

Assembly language programming. Introduction to computer architecture: number systems and representation, memory organization, computer organization; computer arithmetic; input/output. Impact of computer hardware on software. Introduction to assembler techniques. Prerequisite: 15.

104. ELECTROMAGNETIC FIELDS

Study of static and dynamic electric and magnetic fields. Dielectric and magnetic material properties. Maxwell's equations. Plane electromagnetic waves. Prerequisite: E 101.

105. ELECTROMAGNETIC WAVES

The continuation of 104. The propagation of waves as governed by Maxwell's equations are studies. Wave penetration, fundamental wave guides and antennas are included. Prerequisite: 104.

108. MICROWAVE THEORY AND TECHNIQUES
A combined lecture and ratory course covering generation, propagation, and detection of microwave energy. Experiments on klystrons, impedance measurements, antenna radiation patterns, and the characteristics of passive microwave devices. Laboratory. Prerequisite: 104.

111. MATRIX ANALYSIS OF NETWORKS AND SYSTEMS
Review of matrix algebra, elementary network topology, matrix formulation of system equations, network theorems, Laplace transform techniques, sinusoidal steady-state analysis, frequency response plots, two-port network theory, active two-port devices, state-space analysis methods, computer-aided analysis. Prerequisite: E 101.

112. MODERN NETWORK SYNTHESIS AND DESIGN
Design of linear and non-linear operational amplifier circuits. Approximation. Synthesis of passive 1-ports and 2-ports. RC active filter design. Introduction to Linear ICs: PLL and waveform generators. Design Project. Prerequisite: 111.

114. INTRODUCTION TO TOPOLOGICAL ANALYSIS
Topological analysis of passive one-port and two-port networks, flowgraph techniques for the analysis of linear systems, active one-port and two-port analysis, and other engineering applications. Prerequisite: EECS 111.

121. DIGITAL SYSTEM DESIGN AND ANALYSIS
Basic switching concepts. The concept of logical signals. Survey of digital logic circuits including MSI circuits. Number systems. Digital representation of information. Boolean algebra. Switching network description. Introduction to digital computer organization. Prerequisites: E 102.

122. COMPUTER SYSTEM ORGANIZATION AND DESIGN
Integrating large numbers of digital modules into a complete automatic computing system. Magnetic core and LSI semiconductor memory systems. Hardware sequences; microprogramming approaches. Input/output subsystem organization and management; interrupt-driven and DMA transfers. Prerequisites: 22 121.

123. THEORY AND TRANSLATION OF COMPUTER LANGUAGES
The theory and detailed characteristics of high-level languages to facilitate man-comp communications. Assembler algorithms; associated procedures for symbol table management and look-up, memory allocation, syntatic and semantic analysis, and code generation. Theory of formal languages. Prerequisite: EECS22.

124. INTRODUCTION TO MICROPROCESSORS
Overview of microprocessor organization. Hardware/Software tradeoffs. I/O subsystem implementation; interrupt techniques; interfacing keyboards, dis-

plays and memories. Microprocessor software development. Survey of currently available microprocessor. Prerequisites: 22 and 122.

131. CONTROL SYSTEMS I
Detailed considerations of the mathematical theory of linear feedback control systems. Topics include: transfer functions, relation between time and frequency domain characteristics; analysis and design, using root locus concepts and frequency response plots; performance criteria and sensitivity; stability. Laboratory. Prerequisite: Applied Mathematics 106, E101.

132. CONTROL SYSTEMS II (2 units)
Continuation of 131. Controllability and observability. Stabilization by state variable feedback. Optimal linear regulator. Prerequisite: 131.

133. DIGITAL FILTERING
Description of discrete signals. Difference Equations. Convolution Summation. Z-Transform. System Transfer Function and Response. Digital Filters. Design by pole-zero alocation. Prerequisite: AM 106.

141. COMMUNICATIONS SYSTEMS
Signal description. Fourier transforms, filtering, Hilbert transforms, noise description, linear modulation and demodulation, exponential modulation and demodulation, pulse modulation, information theory. Prerequisite: 151.

151. ELECTRONICS I
Electron ballistics, emission theory, semiconductor theory. Extension of the study of electronic amplifiers to include wideband and radio frequency amplifiers, and the principles and applications of feedback. Laboratory. Prerequisites: E 102, EECS 111.

152. ELECTRONICS II
Continuation of 151 to develop features of high-frequency power amplifiers, oscillators, modulation systems. Communications systems. Introduction to non-linear electronic circuits. Laboratory. Prerequisite: 151.

153. ELECTRONICS III
Survey of integrated circuit processes; integrated components. Monolithic linear and digital integrated circuit analysis and design. Prerequisite: 152.

161. ELECTROMECHANICAL ENERGY CONVERSION
Introduction to energy conversion equations and applications to transducers, rotating amplifiers. Machine dynamics, transfer function realization, and modeling of physical electromechanical systems. Laboratory. Prerequisite: E103.

162. ELECTRIC POWER SYSTEMS (2 units)
A study of systems which transmit electric energy from the point of generation to the point of use. Three phase systems. Faults. Reliability. Load flows.

190. UNDERGRADUATE RESEARCH
Open to Departmental Scholars only.

198. SENIOR THESIS AND CONFERENCE
Investigation of an approved electrical engineering problem and preparation of suitable thesis covering the investigation. Meetings with faculty advisor as required. The student presents results of his/her theses work at a Senior Thesis Conference normally held at the outset of the Spring term.

199. INDEPENDENT STUDY
Open to Departmental Scholars only.

MECHANICAL ENGINEERING

Richard K. Pefley, M.E., *Chairman*

Professors: Richard K. Pefley, Michel A. Saad
Associate Professors: Eugene J. Fisher, R. Ian Murray
Instructors: Lee Hornberger, Michael C. McCormack
Senior Research Associate: Dah Yu Cheng, Marcel Vinokur
Lecturers: Peter G. Aline, Gene J. Antonides, Robert P. Caren, Norman G. Kulgein, Gary L. Latshaw, Ernest L. Littauer, Sampath Raganath, Darivsh Rafinejad, Peter A. Szego, Frank E. Talke, Clyde E. Taylor, K. C. Tsai, John R. Viegas, Roger Wedel, Stein Weissenberger, Hans Zulliger

Mechanical Engineering provides the necessary background to design mechanical systems that are effective, efficient, economical and safe. In the Mechanical Engineering Department emphasis is placed on two phases of mechanical engineering: (1) design of machines, and systems for their control; (2) design and analysis of thermofluid systems for the effective utilization of energy. Educational efforts are channeled to impart to prospective engineers not only a fundamental competence but also a versatile perceptive capability in analysis of engineering systems.

11. DESIGN AND MACHINE TOOL PROCESSES
Influence of material selection and manufacturing processes on engineering design.

15. MATERIAL SCIENCE
Physical basis of the electrical, mechanical, and thermal behavior of solids. Relations between structural and physical properties. Theory of dislocations, vacancies, and other defects and their effect on physical properties. Illustra-

tions of the relationship between material selection, manufacturing processes and design. Laboratory. Prerequisite: Physics 6.

110. MACHINE DESIGN I
Analytical and graphical analysis of linkages utilizing statics, dynamics, and strength of materials. Machine elements studied will include electromechanical and pneumatic-hydraulic components. Prerequisites: 11, Engineering 43.

111. MACHINE DESIGN II
Continuation of Machine Design I. System analysis and synthesis will be studied, including control systems. Solutions to design problems will be critically evaluated by employing case studies. Prerequisite: 110.

112. ADVANCED MACHINE DESIGN
Continuation of Machine Design II—Emphasis is placed on design projects. Integration of various components into a complete machine is studied. Prerequisite: M.E. 111.

115. DESIGN OF THERMAL SYSTEMS
Characteristics of thermal system components, mathematical modeling and system simulation. Senior standing required.

125. THERMODYNAMICS
Thermodynamic potentials and availability concepts. Nonreactive mixtures. Reactive mixtures with emphasis on the thermodynamics of combustion and chemical equilibrium. Prerequisite: Engineering 121.

135. HEAT TRANSFER
Introduction to the concepts of conduction, convection, and radiation heat transfer, and application of these concepts to engineering problems. Prerequisite: Engineering 121.

136. TRANSPORTATION SYSTEMS
Evaluation of various modes of transportation systems, including methods of propulsion. Economic and feasibility studies.

138. NUCLEAR REACTORS
Introduction to principles underlying nuclear power reactor design. Senior standing required.

140. ADVANCED DYNAMICS
Derivation and solution of equations of motion of linear dynamic systems. Stability, introduction to feedback control systems, vibration and noise. Prerequisite: Engineering 42.

142. FLUID MECHANICS
Introduction to gas dynamics. Concepts of lift and drag. Mechanics of laminar and turbulent flow. Introduction to boundary-layer theory. Prerequisite: Engineering 121.

150. OPTIMIZATION OF ENGINEERING SYSTEMS I (2)
Methods of evaluating and optimizing complex engineering projects, optimization techniques, decision making under uncertainty, use of the computer in modeling and simulation.

151. OPTIMIZATION OF ENGINEERING SYSTEMS II (2)

198. THESIS AND CONFERENCE
Investigation of an engineering problem and writing of an acceptable thesis. Conferences as required. Prerequisite: Senior standing in Mechanical Engineering.

199. INDIVIDUAL STUDY
By special arrangement with the Chairman of the Department. Credit by arrangement.

ETHNIC STUDIES

Cyril E. Edwards, M.A., *Director*

Acting Assistant Professors; Steven Miller, Jesse De La Cruz
Visiting Lecturer; C. Mack Hall

Ethnic Studies provides an educational process through which operational methods are developed for solving contemporary social and human problems. The methodology of the program ranges from objective analysis through the process of intra-encounter. There is a blending of theory with practice through field-work experiences. Since Ethnic Studies utilizes the experiences of groups who do not enjoy the prerogatives accorded to the dominant population in this country, it serves to provide all students with a more accurate and relevant picture of themselves and their progenitors than could otherwise be obtained.

Emphasis will be on the nature of ethnocentric value systems, the role of the individual in maintaining them and their implications for the future. This focus will be sharpened by a study of the ways in which the individual can initiate communication, interaction, understanding and coexistence on a positive humanistic level with ethnic groups other than one's own.

2,102. RACISM IN AMERICA
An examination of functional racism in contemporary America. The disparity between the ideology and the reality of America, and its impact on the socialization process; institutional and personal racism; the basis of relations between whites and nonwhites; mechanisms for the neutralization of racism.

Students will become more conscious of race as a policy issue which must be confronted.

11,111. THE CHICANO EXPERIENCE
An analysis of the Chicano's social, political, educational, religious, and economic experiences within the framework of America.

13,113. SOURCES OF CHICANO THOUGHT
An investigation of the relationship of contemporary Chicano leaders concepts with Nauhatl and other earlier Mexican philosophies.

16,116. POLITICAL AND ECONOMIC DEVELOPMENT IN MODERN AFRICA
An in-depth examination of selected problems in African political and economic development.

17,117. CHICANO POLITICAL HISTORY
An examination of the political, social, economic and cultural patterns extending north from Mexico.

20,120. COMMUNITY-WORK PROJECT
An opportunity for students to select personal areas of interest for practical, indepth experience. NCX*

24,124. COMPARATIVE BLACK THOUGHT
An analysis of the range of social circumstances Blacks have confronted and an examination of the theories and strategies they have utilized to combat those situations.

25,125. PAN-AFRICANISM
A study of the intellectual development of the Pan-African movement and its impact on political and ideological patterns of both contemporary Africans and Blacks in the Disporea.

26,126. AFRICA: 1400 to INDEPENDENCE

29,129. BLACK PERSPECTIVES
An indepth analysis of one particular Black social institution, ideological disposition, or historical era. An entire quarter will be devoted to such topic as "The Black Church", "The Black Family", "The Civil Rights Movement of the 1960s", etc. Course can be taken as a three-term course.

35,135. ANTI-BLACK THOUGHT IN AMERICA
An examination of a variety of ideas and racial theories used to rationalize the segregation of blacks from the mainstream of American society.

36, 36A, 36B
136, 136A, 136B. CREATIVE THEATRE
Through the use of Black and/or Chicano materials, plays, and playwrights, students will be involved in some aspect of the production, history, and emphatic portrayal of such ethnic material. Course can be taken as a three-term course. NCX*

45,145. CONTEMPORARY EVENTS
An analysis of selected contemporary issues through the method of an active-participant.

46,146. MEXICO AND THE USA
A study of the comparative development of Mexico and the USA with emphasis on California.

49,149. MEXICAN AMERICAN LITERATURE
A survey of Latino writers with an emphasis on contemporary themes.

50,150. ART FORMS IN THE AFRICAN OR BLACK COMMUNITY
An analysis of selected artistic genres, the role of the artist, and other contemporary themes.

51,151. SEMINAR IN ETHNIC STUDIES
An examination of selected principles of American society with particular reference to their relevance for America's minorities.

52,152. GOVERNMENT AND POLITICS IN LATIN AMERICA
The nature and development of U.S. involvement in the political systems of Latin America.

53,153. THE CHICANO IN EDUCATION
An examination of different aspects of the Chicano experience in America's educational institutions.

54,154. THE CHICANO IN CONTEMPORARY SOCIETY
An analysis and interpretation of current Chicano activity, its intellectual sources, its development and its effect on the Mexican American community.

55,155. PEOPLES OF THE SOUTHWEST
An examination of the different peoples who settled the Southwest and their impact on each other.

56,156. MESOAMERICAN HISTORY
A study of the development of pre-Colombian mesoamerica; the social, economic, political, and cultural institutions will be examined.

57, 157. BLACK HISTORY
A course designed to examine the social, political, and economic circumstances American Blacks have faced. Particular emphasis will be given to the analysis of the peculiar institution of American slavery, the post-Civil War reconstruction era, and the first three decades of the current century.

58,158. THEMES IN CHICANO HISTORY
A course designed to provide a historical perspective concerning the Chicano experience in the United States since 1848. Some of the themes will be Anglo-American immigration into the conquered southwest, agribusiness and farm labor, the rise of the Chicano movement, etc.

59,159. THE MEXICAN REVOLUTION
An analysis of the revolutionary upheaval in Mexico from 1876-1960. The leaders, causes, aspirations, and results will be examined.

60,160. THE BLACK WORKER
The historical significance of the Black worker as slave, as a member of a reserve labor pool, and the role of Blacks in private and governmental industries. Selected occupations will be examined indepth, including the Black athlete, domestic workers, intellectuals, etc.

61,161. EMERGING TRENDS IN THE THIRD WORLD
An examination of major ideological, economic, and institutional patterns in developing nation-states. Similarities as well as contrasts will be made, with the focus on African, Asian, South American, and Caribbean nation-states.

198. DIRECTED READING AND RESEARCH
An opportunity for students to do intensive reading and research in an area mutually agreed on between the student and instructor. NCX*

MILITARY SCIENCE

Jerome J. Rogers, Lt. Colonel, *Professor of Military Science*

The University maintains a Senior Division unit of the Army Reserve Officers' Training Corps (ROTC). The program is specifically designed to give college men and women "on-campus" instruction and experience in the art of organizing, motivating, and leading others. It includes instruction to develop self-discipline, physical stamina and bearing—qualities that are an important part of leadership and that contribute to success in any career.

All courses offered by the Military Science Department are fully accredited and applicable toward fulfilling academic requirements for graduation. Through this volun-

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*Exempted from challenge.

tary program, the University offers each eligible man and woman the opportunity to obtain an officer's commission while earning his or her college degree. By combining regular academic pursuits with the Military Science curriculum, the ROTC graduate is well equipped to assume roles of leadership and command responsibility as an officer in the U.S. Army. Uniforms and textbooks are furnished by the Government without cost to the student.

COMMISSIONING REQUIREMENTS

In order to qualify for a commission through the ROTC program, a cadet must successfully complete: (1) the requirements of the Basic Course; (2) the Advanced Course academic curriculum; (3) the ROTC Advanced Camp; and (4) possess at least a Bachelor's Degree. These requirements are established by the Department of the Army and cannot be waived or fulfilled by constructive credit from any source with the exception of the Basic Course requirement.

MULTIPLE ENTRY POINT SYSTEM

The purpose of the multiple entry point system is to provide a wide variety of options for satisfying the Basic Course requirements, thereby qualifying a student for entrance into the Advanced Course and progressing through the remainder of the program for a commission. The system is designed to enable students to enter the Advanced Course through any of the following options: (1) completing the Basic Course academic curriculum; (2) obtaining 90 Leadership Points through Leadership Activities; (3) a combination of partial Basic Course curriculum and 90 Leadership Points; (4) compression of the Basic Course; (5) attending the ROTC Basic Camp; (6) attending the ROTC summer on-campus program; (7) receiving Advanced Placement for veteran status, Junior ROTC, National Guard, or Reserve duty and appropriate Basic Course classes and Leadership Activities.

ACADEMIC CURRICULUM

The Military Science core curriculum consists of two lower division courses (Military Science 13 and 23) and three upper division courses (Military Science 133, 139 and 143). The Dean of the student's major college or school will determine whether the military science core courses fulfill humanities, social sciences, or free elective requirements. It is imperative that the student coordinate closely with and satisfy the academic requirements of his major college or school. In addition to the core curriculum, the Military Science student is required to take two electives approved by the Professor of Military Science. These electives coincide with and fulfill existing humanities and social sciences elective requirements of the colleges and schools within the University.

BASIC COURSE

The basic, lower division courses, Military Science 13 and 23, normally taken during the freshman and sophomore years, provide the student an opportunity to participate in the ROTC program without incurring a military obligation. Participation enables the student to decide whether or not he or she desires to apply for the Advanced

Course, which leads to an officer's commission. Students enrolled in the Basic Course receive four units of academic credit in each of the first two years.

ADVANCED COURSE

The student who desires to enroll in the advanced upper division program, normally taught during the junior and senior years, must apply and be accepted. Only those students who have completed the basic lower division courses or who have otherwise satisfied the Basic Course requirements described above are eligible to enter the Advanced Course.

The Advanced Program consists of two upper division courses, Military Science 133 and 143, taught on-campus and one summer practicum, Military Science 139, conducted during the summer at Fort Lewis, Washington. Students accepted for the Advanced Program receive $100 per month subsistence allowance during the school year. In addition, uniforms and textbooks are provided without cost. During the summer camp the student receives room and board, travel expenses to and from the camp, and approximately $400 for his five weeks' duty at camp. Veteran students enrolled in the ROTC program receive the above in addition to their Veterans Administration benefits.

Students accepted for the advanced program are required to accept a commission, if offered, and to serve on active duty for a period of three years, followed by three years in a reserve status. Five units of academic credit are awarded for MS 133, MS 143, and the five-week advanced camp.

LEADERSHIP ACTIVITIES

Leadership Activities are subdivided into three major categories: (1) Military Skills; (2) Free Electives; and (3) Student Service. All three categories contribute towards leadership development through participation in them outside the classroom environment. No academic credit is given for these activities.

Leadership Points are awarded based on successful completion of an activity. A total of 90 Leadership Points must be obtained prior to entrance into the Advanced Course. This requirement is waived for those obtaining Advanced Placement into the Advanced Course or completing the ROTC Basic Camp. Those students selecting any other option must meet this prerequisite before enrollment in the Advanced Course. At least 30 of the Leadership Points must be attained through completion of Military Skill Leadership Activities. Of the remaining 60 point requirement, no more than 30 may be awarded from the Student Service category.

Military Skill Leadership Activities are those that are principally related to Army functions (e.g., patrolling, weapons firing, drill, etc.). All Advanced Course students must participate in these activities each quarter. Those enrolled in the Military Science academic curriculum are also required to participate in these activities.

Free Elective Leadership Activities are those that are military related but not strictly military in nature (e.g., adventure training, first aid, physical training, etc.).

Student Service Leadership Activities are those that build responsible citizenship and leadership through participation in school and community service activities.

ARMY ROTC SCHOLARSHIP PROGRAM

The Army ROTC scholarship program is designed to offer financial assistance to outstanding young men and women in the four-year Army ROTC program.

Each scholarship provides free tuition, textbooks and laboratory fees in addition to a subsistence allowance of $100 per month during the school year for the period the scholarship is in effect. During summer camp the scholarship student receives the same allowances and expenses described above for advanced program students. The scholarships are provided under provisions of Public Law 88-647, The ROTC Vitalization Act of 1964.

Scholarships may be awarded for one, two, three or four years. Four year scholarships are open to all students entering Army ROTC as freshmen, while the other scholarships are available to those students who have successfully completed one, two or three years of ROTC studies.

The scholarship recipient is expected to maintain acceptable standards of academic achievement and personal conduct. Scholarship students must rank in the upper third of their Army ROTC class and continuously demonstrate leadership potential. The records of scholarship recipients will be reviewed each quarter by the Professor of Military Science to determine the student's eligibility for continued financial assistance.

Recipients of Army ROTC scholarships are required to serve at least four years on active duty unless released earlier by the Secretary of the Army. Any of the six year obligation period remaining after release from active duty must be spent in a reserve status.

Detailed information on the scholarship program may be obtained from the office of the Professor of Military Science at the University.

COMMISSIONING IN THE UNITED STATES ARMY RESERVE AND REGULAR ARMY

Students who complete the Advanced Program are eligible for appointment and commission by the President of the United States as officers in the United States Army Reserve. Reserve commissions are tendered in all branches of the Army, except the Medical, Dental, Veterinary, Judge Advocate, and Chaplain Corps. The branch in which a student is commissioned is determined by his preference, leadership potential, academic background, recommendations of the faculty and staff, and needs of the service. A newly commissioned officer will normally attend his branch school upon being ordered to active duty. Current laws and regulations require each Advanced Program student, upon receipt of his commission, to complete a three-year tour of active duty and to serve in a reserve component for a subsequent period of three years. Delays in reporting to active duty may be granted to students if they desire to obtain an advanced degree. A student may be delayed from call to active duty for a period not to exceed four years, provided he is enrolled in a full-time program of instruction leading toward an advanced degree and remains in good academic standing with the institution in which enrolled. No additional obligation is incurred by this delay for graduate training.

A student who receives his baccalaureate degree and has been designated a "Distinguished Military Graduate" by the President of the University and the Professor of Military Science may, upon application, be commissioned directly in the Regular Army.

Basic Core Courses

13. FUNDAMENTALS OF LEADERSHIP AND MANAGEMENT I, II, III
Four units. The historical growth, development and organization of the Army to include the magnitude of management implications, development of leadership and management abilities through lectures, discussion, and practical exercises. Topographic map reading and aerial photo interpretation. The course covers three quarters, granting one, and two units of credit, respectively. One class hour and one leadership activity period per week during the first and third quarters and two class hours and one leadership activity period per week during the second quarter. A grade is awarded at the end of each quarter. Final grade for the course consists of an average of the grades for the three quarters.

23. APPLIED LEADERSHIP AND MANAGEMENT I, II, III
Four units. Operations of the basic military team to include functions, duties and responsibilities of junior leaders and managers. Continuing development of leadership and managerial abilities through practical exercises emphasizing the student's ability to express himself clearly and accurately. The course covers three quarters, granting one, one, and two units of credit, respectively. Two class hours and one leadership activity period per week during the first and second quarters and one class hour and one leadership activity period per week during the third quarter. A grade is awarded at the end of each quarter. Final grade represents an average of the grades for the three quarters.

Advanced Core Courses

133. ADVANCED LEADERSHIP AND MANAGEMENT I, II, III
Five units. Case studies in leadership and management. Delegation of authority and responsibility, span of control, planning, coordinating, and decision-making. Continued development of the student's ability to express himself with emphasis on analysis of military problems, evaluations of situations, and preparation and delivery of logical solutions. Continual development of individual abilities through practical exercises. The course covers three quarters, granting one, two, and two units of credit, respectively (two class hours and one leadership activity period per week). A grade is awarded at the end of each quarter. Final grade for the course consists of an average of the grades for the three quarters. Prerequisites are Military Science 13 and 23 or alternative satisfaction of Basic Program requirement.

139. PRACTICUM IN LEADERSHIP AND MANAGEMENT
Five units. Five weeks of full-time, intensive training in leadership and management. Training is conducted during the summer at Fort Lewis, Washington. The student's ability to lead his unit and to plan and conduct military op-

erations is thoroughly evaluated. The student is provided the opportunity to apply the theories and principles he has learned in the classroom to actual situations. Prerequisite: Military Science 133. The student receives a PASS/FAIL grade.

143. SEMINAR IN LEADERSHIP AND MANAGEMENT I, II, III

Five units. Analysis of selected leadership and management problems involved in unit administration, military justice, and the Army Readiness Program. Study of military operations and various military teams to include military geography. Practical experience in organizing, planning, and conducting training programs for subordinates. The course covers three quarters and grants one, two, and two units of credit, respectively (two class hours and one leadership activity per week during the first two quarters and one class hour and one leadership activity period during the third quarter). A grade is awarded at the end of each quarter. Final grade consists of an average of the grades for the three quarters. Prerequisite: Military Science 133.

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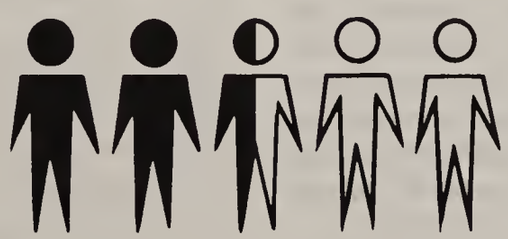

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